























THE MONIST

NETER.




THE EGYPTIAN WORD FOR GOD BY E. A. WALLIS BUDGE.

THE common word given by the Egyptians to God, and god, and spirits of every kind, and being of all sorts, and kinds, and forms, which were supposed to possess any superhuman, supernatural power, was NETER, , and the hieroglyph which is used both as the determinative of this word and also as an ideograph is . Thus we have  or , "god," and , or , or , or , "gods"; the plural is sometimes written out in full, for instance,   . The common word for "goddess" is NETERT, which is either written , or , or ; sometimes the determinative of the word is a woman, , and at others a serpent, e. g., . The plural is NETERIT,   .

We have now to consider what object is supposed to be represented by , and what the word NETER means.

In Bunsen's *Egypt's Place* (I., Nos. 556, 557, 623) the late Dr. Birch described  as a hatchet; in 1872 Dr. Brugsch placed¹ among "objects, tranchants armes" in his classified list of hieroglyphic characters; thus it is clear that the two greatest masters of Egyptology considered  to be either a weapon or a cutting tool, and, in fact, assumed that the hieroglyphic represented an axe-head let into and fastened in a long wooden handle. In the texts wherein the hieroglyphics are colored it is tolerably clear that the axe-head was fastened to its handle by means of thongs of leather. The

¹ *Index des hiéroglyphes phonétiques*, No. 394.

earliest axe-heads were made of stone, or flint or chert, and later of metal, and it is certain that when copper, bronze, and iron took the place of stone or flint, the method by which the head was fastened to the handle was considerably modified. Recently an attempt has been made to show that the axe, , resembled in outline "a roll of yellow cloth, the lower part bound or laced over, the upper part appearing as a flap at the top probably for unwinding. It is possible, indeed, that the present object represents a fetish, e. g., a bone carefully wound round with cloth and not the cloth alone."¹ But it need hardly be said that no evidence for the correctness of these views is forthcoming. Whether the hieroglyphic  was copied from something which was a roll of cloth or a fetish matters little, for the only rational determination of the character is that which has already been made by Drs. Birch and Brugsch, and the object which is represented by  is an axe and nothing else.

Mr. Legge has collected² a number of examples of the presence of the axe as an emblem of divinity on the megaliths of Brittany and in the prehistoric remains of the funeral caves of the Marne, of Scandinavia, and of America, and, what is very much to the point, he refers to an agate cylinder which was published by the late Adrian de Longpérier, wherein is a representation of a priest in Chaldean garb offering sacrifice to an axe standing upright upon an altar. Mr. Legge points out "that the axe appears on these monuments not as the representation of an object in daily use, but for religious or magical purposes," and goes on to say that this is proved by "the fact that it is often found as a pendant and of such materials as gold, lead, and even amber; while that it is often represented with the peculiar fastenings of the earlier flint weapon shows that its symbolic use "goes back to the neolithic and perhaps the palæolithic age."


Mr. Legge is undoubtedly correct in thinking that the use of the stone axe precedes that of the flint arrow-head or flint knife, and many facts could be adduced in support of this view. The


¹ Griffith, *Hieroglyphs*, p. 46.

² *Proc. Soc. Bibl. Arch.*, 1899, p. 310.

stone tied to the end of a stick formed an effective club, which was probably the earliest weapon known to the predynastic Egyptians, and subsequently man found that this weapon could be made more effective still by making the stone flat and by rubbing down one end of it to form a cutting edge. The earliest axe-head had a cutting edge at each end, and was tied by leather thongs to the end of a stick by the middle, thus becoming a double axe; examples of such a weapon appear to be given on the green slate object of the archaic period which is preserved in the British Museum¹ (Nos. 20,790, 20,792), where, however, the axe-heads appear to be fixed in forked wooden handles. In its next form the axe-head has only one cutting edge, and the back of it is shaped for fastening to a handle by means of leather thongs.

When we consider the importance that the axe, whether as a weapon or tool, was to primitive man, we need not wonder that it became to him first the symbol of physical force, or strength, and then of divinity or dominion. By means of the axe the predynastic Egyptians cut down trees and slaughtered animals, in other words, the weapon was mightier than the spirits or gods who inhabited the trees and the animals, and as such became to them at a very early period an object of reverence and devotion. But besides this the axe must have been used in sacrificial ceremonies, wherein it would necessarily acquire great importance, and would easily pass into the symbol of the ceremonies themselves.

The shape of the axe-head as given by the common hieroglyphic  suggests that the head was made of metal when the Egyptians first began to use the character as the symbol of divinity, and it is clear that this change in the material of which the axe-head was made would make the weapon more effective than ever.

Taking for granted, then, that the hieroglyphic  represents an axe, we may be sure that it was used as a symbol of power and divinity by the predynastic Egyptians long before the period when they were able to write, but we have no means of knowing what they called the character or the axe before that period. In dynastic

¹ See my *Egypt under the Great Pyramid Builders*, p. 10, where it is figured and described.


times they certainly called it *NETER* as we have seen, but another difficulty presents itself to us when we try to find a word that will express the meaning which they attached to the word; it is most important to obtain some idea of this meaning, for at the base of it lies, no doubt, the Egyptian conception of divinity or God.

The word *NETER* has been discussed by many Egyptologists, but their conclusions as to its signification are not identical.

M. Pierret thought in 1879 that the true meaning of the word is "renewal, because in the mythological conception, the god assures himself everlasting youth by the renewal of himself in engendering himself perpetually."¹

In the same year, in one of the Hibbert Lectures, Renouf declared that he was "able to affirm with certainty that in this particular case we can accurately determine the primitive notion attached to the word," i. e., to *NUTAR* (*NETER*). According to him, "none of the explanations hitherto given of it can be considered satisfactory," but he thought that the explanation which he was about to propose would be generally accepted by scholars," because it was "arrived at as the result of a special study of all the published passages in which "the word occurs."²

Closely allied to *NUTAR* (*NETER*) is another word *NUTRA* (*NETRA*), and the meaning of both was said by Renouf to be found in the Coptic *noute* or *nout*, which, as we may see from the passages quoted by Tatham in his *Lexicon* (p. 310), is rendered by the Greek words *ισχυς*, *παράκλησις*, and *παρακαλεῖν*. The primary meaning of the word *nout* appears to be "strong," and having assumed that *NETER* was equivalent in meaning to this word, Renouf stated boldly that *NETER* signified "mighty," "might," "strong," and argued that it meant Power, "which is also the meaning of the Hebrew *El*."

¹ "Le mot par lequel on rendait l'idée de Dieu  *nuter*, signifie au propre, 'renouvellement,' parce que dans la conception mythologique, le dieu s'assure une éternelle jeunesse par le renouvellement de lui-même, en s'engendrant lui-même perpétuellement." *Essai sur la Mythologie Égyptienne*, Paris, 1879, page 8.

² *Religion of Ancient Egypt*, p. 93.

We may note in passing that the exact meaning of "El," the Hebrew name for God, is unknown, and that the word itself is probably the name of an ancient Semitic deity.

The passages which were quoted to prove that NETER meant "strong, strength, power," and the like could, as M. Maspero has said¹, be explained differently. M. Maspero combats rightly the attempt to make "strong" the meaning of NETER (masc.), or NETERIT (fem.), in these words: "In the expressions 'a town *neterit*,' 'an arm *neteri*,' . . . is it certain that 'a strong city,' 'a strong arm,' gives us the primitive sense of *neter*? When among ourselves one says 'divine music,' 'a piece of divine poetry,' 'the divine taste of a peach,' 'the divine beauty of a woman' [the word] *divine* is a hyperbole, but it would be a mistake to declare that it originally meant 'exquisite' because in the phrases which I have imagined one could apply it as 'exquisite music,' 'a piece of exquisite poetry,' 'the exquisite taste of a peach,' 'the exquisite beauty of a woman.' Similarly in Egyptian 'a town *neterit*' is a 'divine town'; 'an arm *neteri*' is 'a divine arm,' and *neteri* is employed metaphorically in Egyptian as is [the word] 'divine' in French, without its being any more necessary to attribute to [the word] *neteri* the primitive meaning of 'strong,' than it is to attribute to [the word] 'divine' the primitive meaning of 'exquisite.' The meaning 'strong' of *neteri*, if it exists, is a derived and not an original meaning."²

The view taken about the meaning of *neter* by the late Dr. Brugsch was entirely different, for he thought that the fundamental meaning of the word was "the operative power which created and produced things by periodical recurrence, and gave them new life and restored to them the freshness of youth."

"Die thätige Kraft, welche in periodischer Wiederkehr die Dinge erzeugt und erschafft, ihnen neues Leben verleiht und die Jugendfrische zurückgibt."³

The first part of the work from which these words are quoted appeared in 1885, but that Dr. Brugsch held much the same views six years later is evident from the following extract from his volume

¹ *Études de Mythologie et d'Archéologie Égyptiennes*, tom. ii., p. 215.

² Maspero, *op. cit.*, p. 215. ³ *Religion und Mythologie*, p. 93.

entitled *Die Aegyptologie* (p. 166), which appeared in 1891. Referring to Renouf's contention that NETER has a meaning equivalent to the Greek *δυναμς*, he says:

"Es liegt auf der Hand, dass der Gottesname im Sinne von Starker, Mächtiger, vieles für sich hat, um so mehr als selbst leblose Gegenstände, wie z. B. ein Baustein, adjektivisch als *nutri*, d. h. stark, mächtig, nicht selten bezeichnet werden. Aber so vieles diese Erklärung für sich zu haben scheint, so wenig stimmt sie zu der Thatsache, dass in den Texten aus der besten Zeit (XVIII. Dynastie) das Wort *nutr* als ein Synonym für die Vorstellung der Verjüngung oder Erneuerung auftritt. Er diente zum Ausdruck der periodisch wiederkehrenden Jugendfrische nach Alter und Tod, so dass selbst dem Menschen in den ältesten Sarginschriften zugerufen wird, er sei fortan in einen Gott, d. h. in ein Wesen mit jugendlicher Frische, umgewandelt. Ich lasse es dahingestellt sein, nach welcher Richtung hin die aufgeworfene Streitfrage zu Gunsten der einen oder der anderen Auffassung entschieden werden wird; hier sei nur betont, dass das Wort *nutr*, *nute*, den eigentlichen Gottesbegriff der alten Aegypter in sich schliesst und daher einer ganz besonderen Aufmerksamkeit werth ist."

In this passage Dr. Brugsch substantially agrees with Pierret's views quoted above, but he appears to have withdrawn from the position which he took up in his *Religion und Mythologie*, wherein he asserted that the essential meaning of NETER was identical with that of the Greek *φύσις* and the Latin "natura."¹ It need hardly be said that there are no good grounds for such an assertion, and it is difficult to see how the eminent Egyptologist could attempt to compare the conceptions of a savage or half-savage indigenous African people with those of such cultured nations as the Greeks and the Romans.

The solution of the difficulty of finding a meaning for NETER is not brought any nearer when we consider the views of such distinguished Egyptologists as E. de Rougé, Lieblein, and Maspero. The first of these in commenting on the passage

𓂏𓂏𓂏𓂏 (variant 𓂏𓂏𓂏𓂏) 𓂏𓂏𓂏𓂏𓂏

which he translates "Dieu devenant dieu (en) s'engendrant lui-même," says in his excellent *Chrestomathie Égyptienne* (iii., p. 24):

¹ "Der Inbegriff dieses Wortes deckt sich daher vollständig mit der ursprünglichen Bedeutung des griechischen *physis* und des lateinischen *natura*" (p. 93).

"One knows not exactly the meaning of the verb *nuter*, which forms the radical of the word *nuter*, 'god.' It is an idea analogous to 'to become,' or 'renew oneself,' for *nuteri* is applied to the resuscitated soul which clothes itself in its immortal form."

Thus we find that one of the greatest Egyptologists thinks that the exact meaning of NETER is unknown, but he suggests that it may have a signification not unlike that proposed by Pierret. Professor Lieblein goes a step further than E. de Rougé, for he is of opinion that it is impossible to show the first origin of the idea of God among any people hitherto known historically.

"When we, for instance, take the Indo-Europeans, what do we find there? The Sanskrit word *deva* is identical with the Latin *deus*, and the northern *tívar*; as now the word in Latin and northern language signifies God it must also in Sanskrit from the beginning have had the same signification. That is to say, the Arians, or Indo-Europeans, must have combined the idea of God with this word, as early as when they still lived together in their original home. Because, if the word in their prehistoric home had had another more primitive signification, the wonder would have happened, that the word had accidentally gone through the same development of signification with all these people after their separation. As this is quite improbable, the word must have had the signification of God in the original Indo-European language. One could go even farther and presume that, in this language also, it was a word derived from others, and consequently originated from a still earlier prehistoric language. All things considered it is possible, even probable, that the idea of God has developed itself in an earlier period of languages than the Indo-European. The future will perhaps be able to supply evidence for this. The science of languages has been able partly to reconstruct an Indo-European prehistoric language. It might be able also to reconstruct a prehistoric Semitic, and a prehistoric Hamitic, and of these three prehistoric languages, whose original connection it not only guesses, but even commences to prove gradually, it will, we trust in time, be able to extract a still earlier prehistoric language, which according to analogy might be called Noahitic. When we have come so far, we shall most likely in this prehistoric language, also find words expressing the idea of God. But it is even possible that the idea of God has not come into existence in this prehistoric language either. It may be the first dawning of the idea, and the word God should be ascribed to still earlier languages, to layers of languages so deeply buried that it will be impossible even to excavate them. Between the time of inhabiting caves in the quaternian period, and the historical kingdoms, there is such a long space of time, that it is difficult to entertain the idea, that it was quite devoid of any conception of divinity, so that this should first have sprung up in the historical time. In any case we shall not be able to prove

historically where and when the question first arose, who are the superhuman powers whose activity we see daily in nature and in human life. Although the Egyptians are the earliest civilised people known in history, and just therefore especially important for the science of religion, yet it is even there impossible to point out the origin of the conception of the deity. The oldest monuments of Egypt bring before us the gods of nature chiefly, and among these especially the sun. They mention, however, already early (in the Fourth and Fifth Dynasties) now and then the great power, or the great God, it being uncertain whether this refers to the sun, or another god of nature, or if it was a general appellation of the vague idea of a supernatural power, possibly inherited by the Egyptians. It is probably this great God indicated on the monuments, from the Fourth Dynasty, and later on, who has given occasion to the false belief that the oldest religion of the Egyptians was pure monotheism. But firstly, it must be observed, that he is not mentioned alone but alongside of the other gods, secondly, that he is merely called 'The great God,' being otherwise without distinguishing appellations, and a God of whom nothing else is mentioned, has, so to speak, to use Hegel's language, merely an abstract existence, that by closer examination dissolves into nothing."

It is necessary to quote Professor Lieblein's opinion at length because he was one of the first to discuss the earliest idea of God in connection with its alleged similarity to that evolved by Aryan nations; if, however, he were to rewrite the passage given above in the light of modern research he would, we think, modify many of his conclusions. For our present purpose it is sufficient to note that he believes it is impossible to point out the origin of the conception of the deity among the Egyptians.

The last opinion which we need quote is that of M. Maspero, who not only says boldly that if the word *NETER* or *NETRI* really has the meaning of "strong" it is a derived and not an original meaning, and he prefers to declare that the word is so old that its earliest signification is unknown. In other words, it has the meaning of god, but it teaches us nothing as to the primitive value of this word. We must be careful, he says, not to let it suggest the modern religious or philosophical definitions of god which are current to-day, for an Egyptian god is a being who is born and dies, like man, and is finite, imperfect, and corporeal, and is endowed with passions, and virtues, and vices.² This statement is, of course,

¹ *Egyptian Religion*, by J. Lieblein, Leipzig, 1884.

² *La Mythologie Égyptienne* p. 216 (*Études de Mythologie*, tom. ii., p. 215).

true as regards the gods of the Egyptians at several periods of their history, but it must be distinctly understood, and it cannot be too plainly stated, that side by side with such conception there existed among the educated Egyptians at least ideas of monotheism which are not far removed from those of modern nations.

From what has been said above we see that scholars take the view that the word NETER may mean "renewal," or "strength," or "strong," or "to become," or some idea which suggests "renewal," and that others think its original meaning is not only unknown, but that it is impossible to find it out. But although we may not be able to discover the exact meaning which the word had in pre-dynastic times, we may gain some idea of the meaning which was attached to it in the dynastic period by an examination of a few passages from the hymns and Chapters which are found in the various versions of the *Book of the Dead*. In the text of Pepi I. (line 191) we have the words:

"Behold thy son Horus, to whom thou hast given birth. He hath not placed this Pepi at the head of the dead, but he hath set him among the gods *neteru*,"



Now here *neteru* 𓂏𓂐𓂑 must be an adjective, and we are clearly intended to understand that the gods referred to are those which have the attribute of *neteru*; since the "gods *neteru*," 𓂏𓂐𓂑 𓂏𓂐𓂑, are mentioned in opposition to "the dead" it seems as if we are to regard the gods as "living," i. e., to possess the quality of life. In the text of the same king (line 419) a *bak neter*, 𓂏𓂐𓂑 𓂏𓂐𓂑, i. e., a hawk having the quality of *neter*, is mentioned; and in the text of Unas (l. 569) we read of *bau netru*, 𓂏𓂐𓂑 𓂏𓂐𓂑, or the two souls which possess the quality of *neter*. These examples belong to the Fifth and Sixth Dynasties.

Passing to later dynasties, i. e., the Eighteenth and Nineteenth, etc., we find the following examples of the use of the words *neter* and *netri*.

1. 
hun netri aa heh utet se-mes su tchesef
 Boy *netri*, heir of eternity, begetting and giving birth
 to himself.
2. 
ta-a tu em ab-a ati bakai netri
 I am devoted in my heart without feigning, O thou *netri*
- 
er neteru
 more than the gods.
3. 
tche! - tu re pen her mahu en neträt
 Shall be said this chapter over a crown of *netrat*.
4. 
neter - kuä
 I have become *neter*.
5. 
au - ä khä - kuä em bäk netri
 I have risen up in the form of a hawk *netri*.
6. 
ab - kuä neter - kuä khu - kuä
 I have become pure, I have become *neter*, I have become a
 spirit (*khu*),
- 
user - kuä ba - kuä
 I have become strong, I have become a soul (*ba*).
7. 
unen-f neter mā neteru em Neter-khertet
 this being *neter* with the gods in the Neter-khertet.
 (or, he shall be)

¹ See my *Chapters of Coming Forth by Day*, Text, p. 11, l. 10.² *Ibid.*, p. 43, l. 4.³ *Ibid.*, p. 80, l. 10.⁴ *Ibid.*, p. 154, l. 6.⁵ *Ibid.*, p. 168, l. 3.⁶ *Ibid.*, p. 174, l. 15.⁷ *Ibid.*, p. 417, l. 12.

8. 
auf *netra* *khat-f* *temtu*
 the shall *netra* his body all.
9. 
netri *u* *ba - k* *em* *per* *Sebut*
 They make *neter* thy soul in the house of *Sebut*.
10. 
netri - f *ba - k* *ma* *neteru*
 He makes *neter* thy soul like the gods.
11. 
neter *netri* *kheper tchese* *paut*
 God *netri*, self-produced, primeval matter.

Now, in the above examples it is easy to see that although the words "strong" or "strength," when applied to translate *neter* or *netri*, give a tolerably suitable sense in some of them, it is quite out of place in others, e. g., in No. 6, where the deceased is made to say that he has acquired the quality of *neter*, and a spirit, and a soul, and is, moreover, strong; the word rendered "strong" in this passage is *user*, and it expresses an entirely different idea from *neter*.

From the fact that *neter* is mentioned in No. 1 in connection with eternal existence, and self-begetting, and self-production, and in No. 11 with self-production and primeval matter, it is almost impossible not to think that the word has a meaning which is closely allied to the ideas of "self-existence," and the power to "renew life indefinitely," and "self-production."

In other words, *neter* appears to mean a being who has the power to generate life, and to maintain it when generated. It is useless to attempt to explain the word by Coptic etymologies, for it has passed over directly into the Coptic language under the forms *nouti*, and *noute*, the last consonant, *r*, having disappeared through

¹ See my *Chapters of Coming Forth by Day*, Text, p. 419, l. 7.

² *Ibid.*, p. 509, l. 13.

³ *Ibid.*, p. 511, l. 13.

⁴ *Ibid.*, p. 49, l. 1.

phonetic decay, and the translators of the Holy Scriptures from that language used it to express the words "God" and "Lord." Meanwhile, until new light is thrown upon the subject by the discovery of inscriptions older than any which we now have, we must be content to accept the approximate meaning of *neter* suggested above.

E. A. WALLIS BUDGE.

LONDON, ENGLAND.

THE FOUNDATIONS OF GEOMETRY.

[CONCLUDED.]

DIFFERENT GEOMETRICAL SYSTEMS.

STRAIGHTNESS, flatness, and rectangularity are qualities which cannot (like numbers) be determined in purely quantitative terms. A right angle is not an arbitrary amount of ninety degrees, but the quarter of a circle, and the nature of angles and degrees is not derivable either from arithmetic or from pure reason. A plane is not zero, but a zero of curvature in a boundary between two solids. There is a qualitative element which cannot be expressed in numbers alone; and this qualitative element is determined, as Kant would express it by *Anschauung*, or as we prefer to say by pure motility, viz., it belongs to the domain of the *a priori* of doing.

Our method of creating by construction the straight line, the plane, and the right angle, does not exclude the possibility of other methods of space-measurement, the standards of which would not be even boundaries, such as straight lines, but lines possessed of either a positive curvature like the sphere or a negative curvature rendering their surface pseudo-spherical.

Spheres are well known and do not stand in need of description. Their curvature which is positive is determined by the reciprocal of their radius.

Pseudo-spheres are surfaces of negative curvature, and pseudo-spherical surfaces are saddle-shaped. Only limited pieces can be connectedly represented, and we reproduce from Helmholtz, *loc. cit.*, p. 42, two instances. If arc *ab* in figure 1 revolves round an

axis AB , it will describe a concave-convex surface like that of the inside of a wedding-ring; and in the same way, if either of the curves of figure 2 revolve round their axis of symmetry, it will describe one half of a pseudospherical surface resembling the shape of a morning-glory whose tapering stem is infinitely prolonged. Helmholtz compares the former to an anchor-ring, the latter to a champagne glass.

The sum of the angles of triangles on spheres always exceeds 180° , and the larger the sphere the more will their triangles resemble the triangle in the plane. On the other hand, the sum of the angles of triangles on the pseudosphere will always be somewhat less than 180° . If we define the right angle as the fourth part

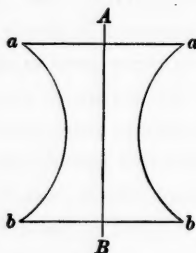


Fig. 1.



Fig. 2.

of a whole circuit, it will be seen that analogously the right angle in the plane differs from the right angles on the sphere as well as the pseudosphere.

We may add that while in spherical space several shortest lines are possible, in pseudospherical space we can draw one shortest line only. Both surfaces, however, are homogeneous (i. e., figures can be moved in it without suffering a change in dimensions), but the parallel lines which do not meet are impossible in either.

We may further construct surfaces in which changes of place involve either expansion or contraction, but it is obvious that they would be less serviceable as systems of space-measurement the more irregular they grow.

DIMENSIONS AS CO-ORDINATES.

But why is space tri-dimensional? Why is it not four or five or n -dimensional?

Let us ask first what "dimension" means.

Does dimension mean direction? Obviously not, for we have seen that the possibilities of direction in space are infinite.

Dimension is only a popular term for coördinate. In space there are no dimensions laid down, but in a space of infinite directions three coördinates are needed to determine from a given point of reference the position of any other point.

We have halved space and produced a plane, P_1 ; we have halved the plane P_1 and produced the straight line AB on the plane. We have halved the straight line, the even boundary between the two half planes, by the perpendicular CD , in the point O , thus producing right angles on the straight line AB , represented in the cross-creases of the twice folded sheet of paper.

The point is simply a place, or as the mathematical term is, a *locus*, viz., a spot in space the site of which is determined by the crossing of two lines. It has no extension, and here our method of producing even boundaries by halving comes to a natural end. So far our products are the plane, the straight line, the point, and as an incidental but valuable by-product, the right angle.

We may now venture on a synthesis of our materials. We lay two planes, P_2 and P_3 , through the two creases at right angles on the original plane P_1 , represented by the sheet of paper, and it becomes apparent that the two new planes P_2 and P_3 will intersect at O , producing a line EF common to both planes P_2 and P_3 , and they will bear the same relation to each as each one does to the original plane P_1 , that is to say: the whole system is congruent with itself. If we make the planes change places, P_1 may as well take the place of P_2 and P_2 of P_3 and P_3 of P_2 or P_1 of P_3 , etc., or *vice versa*, and all the internal relations would remain absolutely the same. Accordingly we have here in this system of the three planes at right angles (the result of repeated halving), a composition

of even boundaries which, as the simplest and least complicated construction of its kind, recommends itself for a standard of measurement of the whole spread of motility.

TRIDIMENSIONALITY.

The most significant feature of our construction consists in this, that we thereby produce a convenient system of reference for determining *all* points in coördinates of straight lines standing at right angles to the three planes.

If we start from the ready conception of objective space (the juxtaposition of things or of loci) we can produce the same result of three planes at right angles by a process of halving. We cut space in two equal halves by the horizontal plane P_1 . We repeat the cutting so as to let the two halves of the first cut in their angular relation to the new cut (in P_2) be congruent with each other, a procedure which is possible only if we make use of the even boundary concept with which we have become acquainted. Accordingly, the second cut should stand at right angles on the first cut. The two planes P_1 and P_2 have one line in common, EF , and any plane placed at right angles to EF (in the point O) will again satisfy the demand of dividing space, including the two planes P_1 and P_2 , into two congruent halves. The two new lines, produced by the cut of the third plane P_3 through the two former planes P_1 and P_2 , stand both at right angles to EF . Should we continue our method of cutting space at right angles in O on either of these lines, we would produce a plane coincident with P_1 , which is to say, that the possibilities of the system are exhausted.

This implies that in any system of pure space *three coördinates are sufficient* for the determination of any place from a given reference point.

The number three is a concept of boundary as much as the straight line. Under specially complicated conditions we might need ten coördinates to calculate the place of a point, but in empty space the number three, the lowest number that is really and truly a number, is sufficient. If space is to be empty space constructed as anyness for the purpose of determining juxtaposition, three co-

ordinates are sufficient, because our system of reference consists of three planes, and we have seen above that there is no possibility of introducing a fourth plane without destroying its character of being congruent with itself, which imparts to it the simplicity that renders it available for a standard of measurement.

Three is a peculiar number which is of great significance. It is the first real number, being the simplest multiplex. One and two are not yet numbers in the full sense of the word. One is the unit, two is a couple or a pair, but three is the smallest amount of a genuine plurality. Savages who can distinguish only between one and two have not yet evolved the notion of number; and the transition to the next higher stage involving the knowledge of "three" passes through a mental condition in which there exists only the notion one, two, and plurality of any kind. When the idea of three is once definitely recognised, the naming of all other numbers can follow in rapid succession.

Certainly it is no accident that in order to construct the simplest figure which is a real figure, at least three lines are needed. The importance of the triangle, which becomes most prominent in trigonometry, is due to its being the simplest possible figure which accordingly possesses the intrinsic worth of economy.

The number three plays also a significant part in logic, and in the branches of the applied sciences, and thus we need not be astonished at finding the three held in religious reverence, for the doctrine of the Trinity has its basis in the constitution of the universe and can be fully justified by the laws of pure form.

THE APPARENT ARBITRARINESS OF THE A PRIORI.

Since Riemann has generalised the conception of space, the tridimensionality of space seems very arbitrary.

Why are three coördinates sufficient for pure space determinations? The obvious answer is, Because we have three planes in our construction of space-boundaries. We might as well ask, why do the three planes cut the entire space into 8 equal parts; the simple answer is that we have halved space three times, and $2^3 = 8$.

The reason is practically the same as the simpler one, why have we two halves if we divide an apple into two equal parts.

These answers are simple enough, but there is another question which here seems in order: Why not continue the method of halving? And there is no other answer than that it is impossible. The two superadded planes P_2 and P_3 both standing at right angles to the original plane, necessarily halve each other, and thus the four right angles of each plane P_2 and P_3 on the centre of intersection, form a complete plane for the same reason that four quarters are one whole. We have in each case four quarters, and $\frac{4}{4} = 1$.

Purely logical arguments (i. e., all modes of reasoning that are rigorously *a priori*, the *a priori* of abstract being) break down and we must resort to the methods of the *a priori* of doing. We cannot understand or grant the argument without admitting the conception of space, previously created by a spread of pure motion. Kant would say that we need here the data of *reine Anschauung*, and Kant's *reine Anschauung* is a product of our motility. As soon as we admit that there is an *a priori* of doing (of free motility) and that our conception of pure space and time (Kant's *reine Anschauung*) is its product, we understand that our mathematical conceptions cannot be derived from pure logic alone but must finally depend upon our motility, viz., the function that begets our notion of space.

If we divide an apple by a vertical cut through its center, we have two halves. If we cut it again by a horizontal cut through its center, we have four quarters. If we cut it again with a cut that is at right angles to both prior cuts, we have eight eighths. It is obviously impossible to insert among these three cuts a fourth cut that would stand at right angles to these others. The fourth cut through the center, if we needs would have to make it, will fall into one of the prior cuts and be a mere repetition of it, producing no result; or if we made it slanting, it would not cut all eight parts but only four of them; it would not produce sixteen equal parts, but twelve unequal parts, viz., eight sixteenths plus four quarters.

If we do not resort to a contemplation of the scope of motion,

if we neglect to represent in our imagination the figure of the three planes and rely on pure reason alone (i. e., the rigid *a priori*), we have no means of refuting the assumption that we ought to be able to continue halving the planes by other planes at right angles. Yet is the proposition as inconsistent as to expect that there should be regular pentagons, or hexagons, or triangles, the angles of which are all ninety degrees.

From the standpoint of pure reason alone we cannot disprove the incompatibility of the idea of a rectangular pentagon. If we insist on constructing by hook or crook a rectangular pentagon, we will succeed, but we must break away from the straight line or the plane. A rectangular pentagon is not absolutely impossible; it is absolutely impossible in the plane; and if we produce one, it will be twisted.

Such was the result of Lobatchevski's and Bolyai's construction of a system of geometry in which the theorem of parallels does not hold. Their geometries cease to be even; they are no longer Euclidean and render the even boundary conceptions unavailable as standards of measurement. That is all.

If by logic we understand consistency, and if anything that is self-contradictory and incompatible with its own nature be called illogical, we would say that it is not the logic of pure reason that renders certain things impossible in our geometric constructions, but the logic of our scope of motion. The latter introduces a factor which determines the nature of geometry, and if this factor is neglected or misunderstood, the fundamental notions of geometry must appear arbitrary.

DEFINITENESS OF CONSTRUCTION.

The problems which puzzle some of the metaphysicians of geometry seem to have one common foundation, which is the definiteness of geometrical construction. Geometry starts from empty nothingness, and we are confronted with rigid conditions which it does not lie in our power to change. We make a construction, and the result is something new, perhaps something which we have

not intended, something at which we are surprised. The synthesis is a child of our own doing, yet there is an objective element in it over which we have no command, and this objective element is rigid, uncompromising, an irrefragable necessity, a stubborn fact, immovable, inflexible, immutable. What is it?

Our metageometricians overlook the fact that their nothingness is not an absolute nothing, but only an absence of concreteness. If they make definite constructions, they must (if they only remain consistent) expect definite results. This definiteness is the logic that dominates their operations. Sometimes the results seem arbitrary, but they never are; for they are necessary, and all questions *why?* can elicit only answers that turn in a circle and are mere tautologies.

Why, we may ask, do two straight lines, if they intersect, produce four angles? Perhaps we did not mean to construct angles, but here we have them in spite of ourselves.

And why is the sum of these four angles equal to 360° ? Why, if two are acute, will the other two be found to be obtuse? Why, if one angle be a right angle, will all four be right angles? Why will the sum of any two adjacent angles be equal to two right angles? etc. Perhaps we should have preferred three angles only, or four acute angles, but we cannot have them, at least not by this construction.

We have seen that the tridimensionality of space is arbitrary only if we judge of it as a notion of pure reason, without taking into consideration the method of its construction as a scope of mobility. Tridimensionality is only one instance of apparent arbitrariness among many others of the same kind.

We cannot construct a figure of two straight lines, and we cannot construct a solid of three even surfaces.

There are only definite forms of polyhedra possible, and the surfaces of every one are definitely determined. To the mind uninitiated into the secrets of mathematics it would seem arbitrary that there are two hexahedra (*viz.*, the cube and the duplicated tetrahedron), while there is no heptahedron. And why can we not

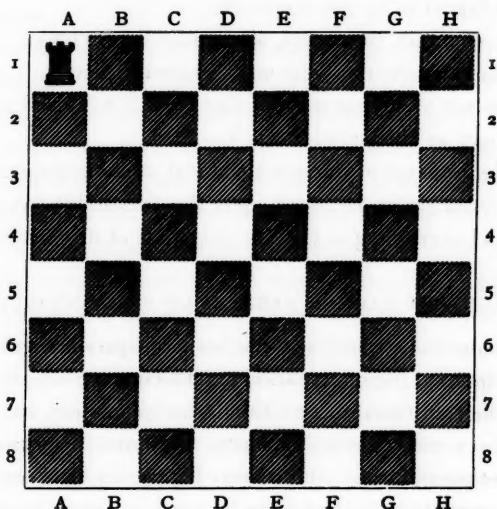
have an octahedron with quadrilateral surfaces? We might as well ask, why is the square not round!

Prof. G. B. Halsted says in the Translator's Appendix to his English edition of Lobatchevsky's *Theory of Parallels*, p. 48:

"But is it not absurd to speak of space as interfering with anything? If you think so, take a knife and a raw potato and try to cut it into a seven-edged solid."

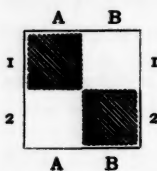
Truly Professor Halsted's contention, that the laws of space interfere with our operations, is true. Yet it is not space that squeezes us, but the laws of construction determine the shape of the figures which we make.

A simple instance that illustrates the way in which space interferes with our plans and movements is the impossible demand on the chess-board to start a rook in one corner (*A 1*) and pass it with the rook motion over all fields once, but only once, and let it end its journey on the opposite corner (*H 8*). Rightly considered



it is not space that interferes with our mode of action, but the law of consistency. The proposition does not contain anything illogical; the words are quite rational and the sentences grammatically correct. Yet is the task impossible, because we cannot turn to the

right and left at once, nor can we be in two places at once, neither can we undo an act once done or for the nonce change the rook into a bishop; but something of that kind would have to be done, if we start from *A 1* and passing with the rook motion through *A 2* and *B 1* over to *B 2*. In other words: Though the demand is not in conflict with the logic of abstract being or the grammar of thinking, it is impossible because it collides with the logic of doing; the logic of moving about, the *a priori* of motility.



The same is true of the squaring of the circle.

We cannot venture on self-contradictory enterprises without being defeated, and if the relation of the circumference to the diameter is an infinite transcendent *series*, being

$$\frac{1}{2}\pi = 1 - \frac{1}{2} + \frac{1}{8} - \frac{1}{4} + \frac{1}{8} - \frac{1}{16} + \frac{1}{16} - \frac{1}{64} + \frac{1}{64} - \frac{1}{256} + \frac{1}{256} - \frac{1}{1024} + \dots$$

we cannot expect to square the circle.

If we compute the series, π becomes 3.14159265..., figures which seem as arbitrary as the most whimsical fancy.

It does not seem less strange that $e = 2.71828$; and yet it is as little arbitrary as the equation $3 \times 4 = 12$.

The definiteness of our mathematical constructions and arithmetical computations is based upon the inexorable law of determinism, and everything is fixed by the mode of its construction.

ONE SPACE, BUT VARIOUS SYSTEMS OF SPACE-MEASUREMENT.

Riemann has generalised the idea of space and would thus justify us in speaking of "spaces." The common notion of space, which is the traditional one of Euclidean geometers, has been degraded into a mere species of space, one possible instance among many other possibilities. And its very legitimacy has been doubted, for it has come to be looked upon in some quarters as only a popular (not to say vulgar and commonplace) notion, a mere working hypothesis, infested with many arbitrary conditions of which the ideal conception of absolute space should be free. How much more interesting and aristocratic are curved space, the dainty two-

dimensional space, and above all the four-dimensional space with its magic powers!

The new space-conception seems bewildering. Some of these new spaces are constructions that are not concretely representable, but only abstractly thinkable; yet they allow us to indulge in ingenious dreams. Think only of two-dimensional beings, and how limited they are! They can have no conception of a third dimension! Then think of four-dimensional beings; how superior they must be to us poor tridimensional beings! As we can take a figure situated within a circle through the third dimension and put it down again outside the circle without crossing the circumference, so four-dimensional beings could take tridimensional things encased in a box from their hiding-place and put them back on some other spot. They could easily help themselves to all the money in the steel-lined safes of our banks, and they could perform the most difficult obstetrical feats without resorting to the dangerous Cæsaræan operation.

Curved space is not less interesting. Just as light may pass through a medium that offers such a resistance as will involve a continuous displacement of the rays, so in curved space the lines of greatest intensity would be subject to a continuous modification. The beings of curved space may be assumed to have no conception of truly straight lines. They must deem it quite natural that if they walk on in the straightest possible manner they will finally but unfailingly come back to the same spot. Their world-space is not as vague and mystical as ours: it is not infinite, hazy at a distance, vague and without end, but definite, well rounded off, and perfect. Presumably their lives have the same advantages moving in boundless circles, while our progression in straight lines hangs between two infinitudes—the past and the future!

All these considerations are very interesting and open new vistas to imaginative speculators and inventors, and we cannot deny that the generalisation of our space-conception has proved helpful by throwing new light upon geometrical problems and widening the horizon of our mathematical knowledge.

Nevertheless after a mature deliberation of Riemann's propo-

sition, I have come to the conclusion that it leads us off in a wrong direction, and in contrast to his conception of space as being one instance among many possibilities, I would insist upon the uniqueness of space. Space is the possibility of motion in all directions, and mathematical space is the ideal construction of our scope of motion in all directions.

The homogeneity of space is due to our abstraction which omits all particularities, and its homaloidality means only that straight lines are possible and will best serve us as standards of measurement.

Curved space, so called, is a more complicated construction of space-measurement to which some additional feature of a particular nature has been admitted, and in which we waive the advantages of even boundaries as means of measurement.

Space, the actual scope of motion, remains different from all systems of space-measurement, be they homaloidal or curved, and should not be subsumed with them under one and the same category.

Riemann's several space-conceptions are not spaces in the proper sense of the word, but systems of space-measurement. It is true that space is a tridimensional manifold, and a plane a two-dimensional manifold, and we can think of other systems of n manifoldness; but for that reason all these different manifolds do not become spaces. Man is a mammal having two prehensiles (his hands); the elephant is a mammal with one prehensile (his trunk); tailless monkeys like the pavian have four; and tailed monkeys have five prehensiles. Is there any logic in extending the denomination man to all these animals, and should we define the elephant as a man with one prehensile, the pavian as a man with four prehensiles and tailed monkeys as men with five prehensiles? Our zoölogists would at once protest and denounce it as an illogical misuse of names.

Space is a manifold, but not every manifold is a space.

Of course every one has a right to define the terms he uses, and obviously my protest simply rejects Riemann's use of a word,

but I claim that his identification of "space" with "manifold" is the source of inextricable confusion.

It is well known that all colors can be reduced to three primary colors, yellow, red, and blue, and thus we can determine any possible tint by three coördinates, and color just as much as mathematical space is a threefold, viz., a system in which three coördinates are needed for the determination of any thing. But because color is a threefold, no one would assume that color is space.

Riemann's manifolds are systems of measurement, and the system of three coördinates on three intersecting planes is an *a priori* or pure formal and ideal construction invented to calculate space. We can invent other more complicated systems of measurement, with curved lines and with more than three or less than three coördinates. We can even employ them for space-measurement, although they are rather awkward and unserviceable; but these systems of measurement are not "spaces" and if they are called so, they are spaces by courtesy only. By a metaphorical extension we allow the idea of system of space-measurement to stand for space itself. It is a brilliant idea and quite as ingenious as the invention of animal fables in which our quadruped fellow-beings are endowed with speech and treated as human beings. But such poetical licences, in which facts are stretched and the meaning of terms is slightly modified, is possible only if instead of the old-fashioned straight rules of logic we grant a slight curvature to our syllogisms.

FICTITIOUS SPACES AND THE APRIORITY OF ALL SYSTEMS OF SPACE-MEASUREMENT.

Mathematical space, so called, is strictly speaking no space at all, but the mental construction of a manifold, being a tridimensional system of space-measurement invented for the determination of actual space.

Neither can a manifold of two dimensions be called a space. It is a mere boundary in space, it is no reality, but a concept, a construction of pure thought.

Further, the manifold of four dimensions is a system of meas-

urement applicable to any reality for the determination of which four coördinates are needed. It is applicable to real space if there is connected with it in addition to the three planes at right angles another condition of a constant nature, such as gravity.

At any rate, we must deny the applicability of a system of four dimensions to empty space void of any such particularity. Unless Riemann can show that sixteen cubes (neither more nor fewer) could be so placed together that they have one point of common contact, I must regard the idea of four-dimensional space as chimerical, the word space being used in the common acceptance of the term as juxtaposition or as the scope of motion. So long as four quarters make one whole, and four right angles make one entire circumference, and so long as the contents of a sphere which covers the entire scope of motion round its center equals $\frac{4}{3}\pi r^3$, there is no sense in entertaining the idea that empty space might be four-dimensional.

But the argument is made and sustained by Helmholtz that as two dimensional beings perceive two dimensions only and are unable to think how a third dimension is at all possible, so we tri-dimensional beings cannot represent in thought the possibility of a fourth dimension. Helmholtz, speaking of beings of only two dimensions living on the surface of a solid body, says:

"If such beings worked out a geometry, they would of course assign only two dimensions to their space. They would ascertain that a point in moving describes a line, and that a line in moving describes a surface. But they could as little represent to themselves what further spatial construction would be generated by a surface moving out of itself, as we can represent what should be generated by a solid moving out of the space we know. By the much-abused expression 'to represent' or 'to be able to think how something happens' I understand—and I do not see how anything else can be understood by it without loss of all meaning—the power of imagining the whole series of sensible impressions that would be had in such a case. Now, as no sensible impression is known relating to such an unheard-of event, as the movement to a fourth dimension would be to us, or as a movement to our third dimension would be to the inhabitants of a surface, such a 'representation' is as impossible as the 'representation' of colors would be to one born blind, if a description of them in general terms could be given to him.

"Our surface-beings would also be able to draw shortest lines in their superficial space. These would not necessarily be straight lines in our sense, but what

are technically called *geodetic lines* of the surface on which they live; lines such as are described by a *tense* thread laid along the surface, and which can slide upon it freely."....

"Now, if beings of this kind lived on an infinite plane, their geometry would be exactly the same as our planimetry. They would affirm that only one straight line is possible between two points; that through a third point lying without this line only one line can be drawn parallel to it; that the ends of a straight line never meet though it is produced to infinity, and so on."....

"But intelligent beings of the kind supposed might also live on the surface of a sphere. Their shortest or straightest line between two points would then be an arc of the great circle passing through them."....

"Of parallel lines the sphere-dwellers would know nothing. They would maintain that any two straightest lines, sufficiently produced, must finally cut not in one only but in two points. The sum of the angles of a triangle would be always greater than two right angles, increasing as the surface of the triangle grew greater. They could thus have no conception of geometrical similarity between greater and smaller figures of the same kind, for with them a greater triangle must have different angles from a smaller one. Their space would be unlimited, but would be found to be finite or at least represented as such.

"It is clear, then, that such beings must set up a very different system of geometrical axioms from that of the inhabitants of a plane, or from ours with our space of three dimensions, though the logical powers of all were the same."

I deny what Helmholtz implicitly assumes that sensible impressions are needed to enable us to represent purely formal relations. Thus we have the idea of a surface as a boundary between solids, but surfaces do not exist in reality. All real objects are solid, and our idea of surface is a mere abstraction. Two dimensional things are unreal, and yet we form the notion of surfaces, and lines, and points, and pure space, etc. There is no straight line in existence, yet we have the notion of a straight line. The straight lines on paper are incorrect pictures of the true straight lines which are purely ideal constructions. Our *a priori* constructions are not a product of our sense-impressions, but are independent of sense or anything sensed. They are purely formal, and even if we grant that two-dimensional beings were possible, we would have no reason to assume that two-dimensional beings could not construct a tridimensional space-conception.

Two-dimensional beings could not be possessed of a material

body, because their absolute flatness substantially reduces their shape to nothingness. But if they existed, they would be limited to movements in two directions and thus must be expected to be incredulous as to the possibility of jumping out of their flat existence and returning into it through a third dimension. Having never moved in a third dimension, they could speak of it as the blind might discuss colors; in their flat minds they could have no true conception of its significance and would be unable clearly to picture it in their imagination; but for all their limitations, they could very well develop the abstract idea of tri-dimensional space and therefrom derive all particulars of its laws and conditions and possibilities.

We ourselves are tridimensional; we can measure the space in which we move with three coördinates, yet we can definitely say that if space were four-dimensional, a body constructed of two factors, so as to have a four-dimensional solidity, would be expressed in the formula:

$$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4.$$

We can calculate, compute, excogitate, and describe all the characteristics of four-dimensional space, so long as we remain in the realm of abstract thought and do not venture to make use of our motility and execute our plan in an actualised construction of motion. From the standpoint of pure logic, there is nothing irrational about the assumption; but as soon as we make an *a priori* construction of the scope of our motility, we find out the incompatibility of the whole scheme. Helmholtz continues:

"But let us proceed still farther.

"Let us think of reasoning beings existing on the surface of an egg-shaped body. Shortest lines could be drawn between three points of such a surface and a triangle constructed. But if the attempt were made to construct congruent triangles at different parts of the surface, it would be found that two triangles, with three pairs of equal sides, would not have their angles equal."

If there were two-dimensional beings living on an egg-shell, they would most likely have to determine the place of their habitat by experience just as much as we tridimensional beings living on a

flattened sphere have to map out our world by measurements made *a posteriori* and based upon *a priori* systems of measurement.

If the several systems of space-measurement were not *a priori* constructions, how could Helmholtz who does not belong to the class of two-dimensional beings tell us what their notions must be like?

I claim that if there were surface beings on a sphere or on an egg-shell, they would have the same *a priori* notions as we have; they would be able to construct straight lines, even though they were constrained to move in curves only; they would be able to define the nature of a space of three dimensions and would probably locate in the third dimension their gods and the abode of spirits. I insist that not sense experience, but *a priori* considerations, teach us the notions of straight lines.

The truth is that we tridimensional beings actually do live on a sphere, and we cannot get away from it. What is the highest flight of an æronaut and the deepest descent into a mine if measured by the radius of the earth? If we made an exact imitation of our planet, a yard in diameter, it would be like a polished ball, and the highest elevations would be less than a grain of sand; they would not be noticeable were it not for a difference in color and material.

When we become conscious of the nature of our habitation, we do not construct *a priori* conceptions accordingly, but feel limited to a narrow surface and behold with wonder the infinitude of space beyond. We can very well construct other *a priori* notions which would be adapted to one, or two, or four-dimensional worlds, or to spaces of positive or of negative curvatures, for all these constructions are ideal; they are mind-made and we select from them the one that would best serve our purpose of space-measurement.

The claim is made that if we were four-dimensional beings, our present three-dimensional world would appear to us as flat and shallow, as the plane is to us in our present tridimensional predicament. That statement is true, because it is conditioned by an "if." And what pretty romances have been built upon it! I remind my reader only of the ingenious story *Flatland*, Written by a

Square, and portions of Wilhelm Busch's charming tale *Edward's Dream*¹; but the worth of conditional truths depends upon the assumption upon which they are made contingent, and the argument is easy enough that if things were different, they would not be what they are. If I had wings, I could fly; if I had gills I could live under water; if I were a magician I could work miracles.

INFINITUDE.

The notion is rife at present that infinitude is self-contradictory and impossible. But that notion originates from the error that space is a thing, an objective and concrete reality, if not actually material, yet consisting of some substance or essence. It is true that infinite things cannot exist, for things are always concrete and limited; but space is pure potentiality of concrete existence. Pure space is materially considered nothing. That this pure space (this apparent nothing) possesses some very definite positive qualities is a truth which at first sight may seem strange, but on closer inspection is quite natural and will be conceded by every one who comprehends the paramount significance of the doctrine of pure form.

Space being pure form of extension, it must be infinite, and infinite means that however far we go, in whatever direction we choose, we can go farther, and will never reach an end. Time is just as infinite as space. Our sun will set and the present day will pass away, but time will not stop. We can go backward to the beginning, and we must ask what was before the beginning. Yet suppose we could fill the blank with some hypothesis or another, mythological or metaphysical, we would not come to an absolute beginning. The same is true as to the end. And if the universe broke to pieces, time would continue, for even the duration in which the world would lie in ruins would be measurable.

Not only is space as a totality infinite, but in every part of space we have infinite directions.

What does it mean that space has infinite directions? If you

¹ *The Open Court*, Vol. VIII., p. 4266 et seq.

lay down a direction by drawing a line from a given point, and continue to lay down other directions, there is no way of exhausting your possibilities. Light travels in all directions at once; but "all directions" means that the whole extent of the surroundings of a source of light is agitated, and if we attempt to gather in the whole by picking up every single direction of it, we stand before a task that cannot be finished.

In the same way any line, though it be of definite length, can suffer infinite division, and the fraction $\frac{1}{2}$ is quite definite while the same amount if expressed in decimals as $0.333\dots$, can never be completed. Light actually travels in all directions, which is a definite and concrete process, but if we try to lay them down one by one we find that we can as little exhaust their number as we can come to an end in divisibility or as we can reach the boundary of space, or as we can come to an ultimate number in counting. In other words reality is actual and definite but our mode of measuring it or reducing it to formulas admits of a more or less approximate treatment only, being the function of an infinite progress in some direction or other. There is an objective *raison d'être* for the conception of the infinite, but our formulation of it is subjective, and the puzzling feature of it originates from treating the subjective feature as an objective fact.

These considerations indicate that infinitude does not appertain to the thing, but to our method of viewing the thing. Things are always concrete and definite, but the relational of things admits of a progressive treatment. Space is not a thing, but the relational feature of things. If we say that space is infinite, we mean that a point may move incessantly and will never reach the end where its progress would be stopped.

There is a phrase current that the finite cannot comprehend the infinite. Man is supposed to be finite, and the infinite is identified with God or the Unknowable, or anything that surpasses the comprehension of the average intellect. The saying is based upon the prejudicial conception of the infinite as a realised actuality, while the infinite is not a concrete thing, but a series, a process, an aspect, or the plan of action that is carried on without stopping

and shall not, as a matter of principle, be cut short. Accordingly, the infinite (though in its completeness unactualisable) is neither mysterious nor incomprehensible, and though mathematicians be finite, they may very successfully employ the infinite in their calculations.

I do not say that the idea of infinitude presents no difficulties, but I do deny that it is a self-contradictory notion and that if space must be conceived to be infinite, mathematics will sink into mysticism.

GEOMETRY REMAINS A PRIORI.

Those of our readers who have closely followed our arguments will now understand how in one important point we cannot accept Mr. B. A. W. Russell's statement as to the main result of the meta-geometrical inquiries. He says:

"There is thus a complete divorce between geometry and the study of actual space. Geometry does not give us certain knowledge as to what exists. That peculiar position which geometry formerly appeared to occupy, as an *a priori* science giving knowledge of something actual, now appears to have been erroneous. It points out a whole series of possibilities, each of which contains a whole system of connected propositions; but it throws no more light upon the nature of our space than arithmetic throws upon the population of Great Britain. Thus the plan of attack suggested by non-Euclidean geometry enables us to capture the last stronghold of those who attempt, from logical or *a priori* considerations, to deduce the nature of what exists. The conclusion *suggested* is, that no existential proposition can be deduced from one which is not existential. But to *prove* such a conclusion would demand a treatise upon all branches of philosophy."¹

It is a matter of course that the single facts as to the population of Great Britain must be supplied by counting, and in the same way the measurement of angles and actual distances must be taken by *a posteriori* transactions; but having ascertained some lines and angles, we can (assuming our data to be correct) calculate other items with absolute exactness by purely *a priori* argument. There is no need (as Mr. Russell puts it) "from logical or *a priori* considerations to deduce the nature of what exists,"—

¹ In the new volumes of the *Encyclopædia Britannica*, Vol. XXVIII., of the complete work, s. v. Geometry, Non-Euclidean, p. 674.

which seems to mean, to determine special features of concrete instances. No one ever assumed that the nature of particular cases, the qualities of material things, or sense-affecting properties, could be determined by *a priori* considerations. The real question is, whether or not the theorems of space relations and, generally, purely formal conceptions, such as are developed *a priori* in geometry and kindred formal sciences, will hold good in actual experience. In other words, can we assume that form is an objective quality, which would imply that the constitution of the actual world must be the same as the constitution of our purely *a priori* sciences? We answer this latter question in the affirmative.

We cannot determine by *a priori* reasoning the population of Great Britain. But we can *a posteriori* count the inhabitants of several towns and districts, and determine the total by addition. The rules of addition, of division, and multiplication can be relied upon for the calculation of objective facts.

Or to take a geometrical example. When we measure the distance between two observatories and also the angles at which at either end of the line thus laid down the moon appears in a given moment, we can calculate the moon's distance from the earth; and this is possible only on the assumption that the formal relations of objective space are the same as those of mathematical space. In other words, that our *a priori* mathematical calculations can be made to throw light upon the nature of space,—the real objective space of the world in which we live.

* * *

The result of our inquisition is quite conservative. It reestablishes the apriority of mathematical space, yet in doing so it justifies the method of metaphysicians in their constructions of the several non-Euclidean systems. *A priori* considered, the latter have equal rights with plane geometry, but for all that Euclidean geometry, which in the parallel theorem takes the bull by the horns, will remain classical forever, for after all the non-Euclidean systems cannot avoid developing the notion of the straight line or other even boundaries. Any geometry could, within its own premises, be utilised for a determination of objective space; but we will

naturally give the preference to plane geometry, not because it is truer, but because it is simpler and will therefore be more serviceable.

How an ideal (and apparently purely subjective) construction can give us any information of the objective constitution of things, viz., so far as space-relations are concerned seems mysterious but the problem is solved if we bear in mind the objective nature of the *a priori*,—a subject which we have discussed in a previous chapter.¹

SENSE-EXPERIENCE AND SPACE.

We have learned that sense-experience cannot be used as a source from which we construct our fundamental notions of geometry, yet sense-experience justifies them.

Experience can verify *a priori* constructions (as, e. g., tridimensionality is verified in Newton's laws), and can never change them. If experience does not tally with our calculations, we have either made a mistake or made a wrong observation. For our *a priori* conceptions hold good for any conditions, and their theory can be as little wrong as reality can be inconsistent.

However, some of the most ingenious thinkers and great mathematicians do not conceive of space as mere potentiality of existence, which renders it formal and purely *a priori*, but think of it as a concrete reality, as though it were a big box, presumably round, like an immeasurable sphere. If it were such, space would be (as Riemann says) boundless but not infinite, for we cannot find a boundary on the surface of a sphere, and yet the sphere has a finite surface that can be expressed in definite numbers.

I should like to know what Riemann would call that something which lies outside of his spherical space. Would the name "province of the extraspatial" perhaps be an appropriate term? I do not know how we can rid ourselves of this enormous portion of unutilised outside room. Strange though it may seem, this space-conception of Riemann counts among its advocates mathematicians

¹ See also the author's exposition of the problem of the *a priori* in his edition of *Kant's Prolegomena*, pp. 167-240.

of first rank, among whom I will here mention only the name of Sir Robert Ball.

It will be interesting to hear a modern thinker who is strongly affected by metageometrical studies, on the nature of space. Mr. Charles S. Peirce, an uncommonly keen logician and an original thinker of no mean repute, proposes the following three alternatives. He says:

"First, space is, as Euclid teaches, both *unlimited* and *immeasurable*, so that the infinitely distant parts of any plane seen in perspective appear as a straight line, in which case the sum of the three angles of a triangle amounts to 180° ; or,

"Second, space is *immeasurable* but *limited*, so that the infinitely distant parts of any plane seen in perspective appear as a circle, beyond which all is blackness, and in this case the sum of the three angles of a triangle is less than 180° by an amount proportional to the area of the triangle; or

"Third, space is *unlimited* but *finite* (like the surface of a sphere), so that it has no infinitely distant parts; but a finite journey along any straight line would bring one back to his original position, and looking off with an unobstructed view one would see the back of his own head enormously magnified, in which case the sum of the three angles of a triangle exceeds 180° by an amount proportional to the area.

"Which of these three hypotheses is true we know not. The largest triangles we can measure are such as have the earth's orbit for base, and the distance of a fixed star for altitude. The angular magnitude resulting from subtracting the sum of the two angles at the base of such a triangle from 180° is called the star's *parallax*. The parallaxes of only about forty stars have been measured as yet. Two of them come out negative, that of Arided (*a* Cyni), a star of magnitude $1\frac{1}{2}$, which is $-0''.082$, according to C. A. F. Peters, and that of a star of magnitude $7\frac{3}{4}$, known as Piazzi III 422, which is $-0''.045$ according to R. S. Ball. But these negative parallaxes are undoubtedly to be attributed to errors of observation; for the probable error of such a determination is about $\pm 0''.075$, and it would be strange indeed if we were to be able to see, as it were, more than half way round space, without being able to see stars with larger negative parallaxes. Indeed, the very fact that of all the parallaxes measured only two come out negative would be a strong argument that the smallest parallaxes really amount to $+0''.1$, were it not for the reflexion that the publication of other negative parallaxes may have been suppressed. I think we may feel confident that the parallax of the furthest star lies somewhere between $-0''.05$ and $+0''.15$, and within another century our grandchildren will surely know whether the three angles of a triangle are greater or less than 180° ,—that they are *exactly* that amount is what nobody ever can be justified in concluding. It is true that according to the axioms of geometry the sum of the

three sides of a triangle are precisely 180° ; but these axioms are now exploded, and geometers confess that they, as geometers, know not the slightest reason for supposing them to be precisely true. They are expressions of our inborn conception of space, and as such are entitled to credit, so far as their truth could have influenced the formation of the mind. But that affords not the slightest reason for supposing them exact." (*The Monist*, Vol. I., pp. 173-174.)

Now, let us for argument's sake assume that the measurements of star-parallaxes unequivocally yield results which indicate that the sum of the angles in cosmic triangles is either a trifle more or a trifle less than 180° ; would we have to conclude that cosmic space is curved, or would we not have to look for some concrete and special cause for the aberration of the light? If the moon is eclipsed while the sun still appears on the horizon, it proves only that the refraction of the solar rays makes the sun appear higher than it really stands, if its position is determined by a straight line, but it does not refute the straight line conception. Measurements of star parallaxes (if they could no longer be accounted for by the personal equation of erroneous observation), may prove that ether can slightly deflect the rays of light, but it will never prove that the straight line of plane geometry is really a curve. We might as well say that the norms of logic are refuted when we make faulty observations or whenever we are confronted by contradictory statements. No one feels called upon, on account of the many lies that are told, to propose a theory on the probable curvature of logic. Yet seriously speaking, in the province of pure being the theory of a curved logic has the same right to a respectful hearing as the curvature of space in the province of the scope of pure motility.

Ideal constructions, like the systems of geometry, logic, etc., cannot be refuted by facts. Our observation of facts may call attention to the logical mistakes we have made, but experience cannot overthrow logic itself or the principles of thinking. They bear their standard of correctness in themselves which is based upon the same principle of consistency that pervades any system of actual or purely ideal operations.

But if space is not round, are we not driven to the other horn of the dilemma that space is infinite?

Perhaps we are. What of it? I see nothing amiss in the idea of infinite space.

By the by, if objective space really is curved, would not the probability be one to infinity that its twist can scarcely be limited to the curvature of a circle, but will deviate as well in some other direction so that the straightest line would be spiral? And the spiral is as infinite as the straight line. Obviously, curved space does not get rid of infinitude; besides the infinitely small, which would not be thereby eliminated, is not less troublesome than the infinitely great.

THE TEACHING OF MATHEMATICS.

Euclid avoided the word axiom and I believe with Grassmann, that its omission in the *Elements* is not accidental but well-considered intention. The introduction of the term among Euclid's successors is due to a lack of clearness as to the nature of geometry and the conditions through which its fundamental notions originate.

It may be a flaw in the Euclidean *Elements* that the construction of the plane is presupposed, but it does not invalidate the details of his glorious work which will forever remain classical.

The invention of other geometries can only serve to illustrate the truth that all geometries, the plane geometry of Euclid included, are *a priori* constructions, and were not for obvious reasons Euclid's plane geometry preferable, other systems might as well be employed for the purpose of space-determination. Neither homaloidality nor curvature belongs to space; they belong to the several systems of manifolds that can be invented for the determination of the juxtaposition of things, called space.

If I had to rearrange the preliminary expositions of Euclid, I would state first the *Common Notions* which embody those general principles of Pure Reason and are indispensable for geometry. Then I would propose the *Postulates* which set forth our own activity (viz., the faculty of construction) and the conditions under which we intend to carry out our operations, viz., the obliteration of all particularity, characterisable as "anyness of motion," and finally I

would lay down the *Definitions* as the most elementary constructions which are to serve as tools and objects for experiment in the further expositions of geometry. There would be no mention of axioms, nor would we have to regard anything as an assumption or an hypothesis.

Professor Hilbert has methodically arranged the principles that underlie mathematics, and the excellency of his work is universally recognised.¹ It is a pity, however, that he retains the term "axiom," and we would suggest replacing it by some other appropriate word. "Axiom" with Hilbert does not mean an obvious truth that does not stand in need of proof, but principle, or rule, viz., a formula describing certain general characteristic conditions.

Mathematical space is an ideal construction, and as such it is *a priori*. But its apriority is not as rigid as is the apriority of logic. It presupposes not only the rules of pure reason but also our own activity (viz., pure motility) both being sufficient to create any and all geometrical figures *a priori*.

Boundaries that are congruent with themselves being limits that are unique recommend themselves as standards of measurement. Hence the significance of the straight line, the plane, and the right angle.

The theorem of parallels is only a side issue of the implications of the straight line.

The postulates that figures of the same relations are congruent in whatever place they may be, and also that similar figures can be drawn to any figure, is due to our abstraction which creates the condition of anyness.

The teaching of mathematics, now utterly neglected in the public schools and not specially favored in the high schools, should begin early, but Euclid's method with his pedantic propositions and proofs should be replaced by construction work. Let children begin geometry by doing, not by reasoning. The reasoning faculties are not yet sufficiently developed in a child. Abstract reasoning is tedious, but if it comes in as an incidental aid to construc-

¹ *The Foundations of Geometry*, The Open Court Pub. Co., Chicago, 1902.

tion, it will be welcome. Action is the main-spring of life and the child will be interested so long as there is something to achieve.¹

Lines must be divided, perpendiculars dropped, parallel lines drawn, angles measured and transferred, triangles constructed, unknown quantities determined with the help of proportion, the nature of the triangle studied and its internal relations laid down and finally the right-angled triangle computed by the rules of trigonometry, etc. All instruction should consist in giving *tasks to be performed, not theorems to be proved*; and the pupil should find out the theorems merely because he needs them for his construction.

In the triangle as well as in the circle we should accustom ourselves to using the same names for the same parts.²

Every triangle is ABC . The angle at A is always α , on B β , on C γ . The side opposite A is a , opposite B b , opposite C c . The three heights are h_a, h_b, h_c . The lines that from A, B , and C pass through the center of gravity to the middle of the opposite sides I propose to call gravitals and would designate them g_a, g_b, g_c . The perpendiculars erected upon the middle of the sides meeting in the center of the circumscribed circle are p_a, p_b, p_c . The lines that divide the angles α, β, γ and meet in the center of the inscribed circle I propose to call "dichotoms" (from $\delta\iota\chi\omicron\tau\omicron\mu\omicron\varsigma$ ³) and would designate them as d_a, d_b, d_c . The radius of the circumscribed circle is r , of the inscribed circle ρ , and the radii of the three ascribed circles are ρ_a, ρ_b, ρ_c . The point where the three heights meet is H , where the three gravitals meet R , where the three dichotoms meet O .⁴ The stability of designation will be indispensable for a clear comprehension of these important interrelated parts.

EPILOGUE.

While matter is eternal and energy is indestructible, forms change; yet there is a feature in the changing forms of matter and

¹ Cp. the author's article "Anticipate the School" (*Open Court*, 1899, p. 747).

² Such was the method of my teacher Prof. Hermann Grassmann.

³ I purposely avoid the term *median* which is sometimes used in the sense of gravitals, sometimes as dichotoms. Thus the word median remains reserved for a general use.

⁴ The capital of the Greek ρ is objectionable, because it cannot be distinguished from the Roman P .

energy that does not change. It is the norm that determines the nature of all formations, commonly called law or uniformity.

The law of form is the condition that dominates our thinking and constitutes the norm of all formation, the principle of consistency which underlies our ideas of sameness, uniformity, rule, etc. This norm is not a concrete fact of existence but the universal feature that permeates both the anyness of our mathematical constructions and the anyness of objective conditions. Its application produces in the realm of mind the *a priori*, and in the domain of facts the uniformities of events which our scientists reduce to formulas, called laws of nature. On a superficial inspection it is pure nothingness, but in fact it is universality, eternity, and omnipresence; and it is the factor objectively of the world order and subjectively of science, the latter being man's capability of reducing the innumerable sense-impressions of experience to a methodical system of knowledge.

Faust, seeking the ideal of beauty, is advised to search for it in the domain of the eternal types of existence, which is the omnipresent Nowhere, the ever enduring Never. Mephistopheles calls it the Naught.¹ The norm of being, the foundation of natural law, the principle of thinking, is non-existent to Mephistopheles, and in his way Mephistopheles is right: but it is at the same time the rock of ages, it is the divinity of existence, and we might as well answer with a slight change of words, replacing "All" by "God," thus intensifying the meaning of Faust's reply:

"'Tis in thy naught I hope to find my God."

The norm of Pure Reason, the factor that shapes the world, the eternal Logos, is omnipresent and eternal. It is God. The laws of nature have not been fashioned by a creator, they are part and parcel of the creator himself. Plutarch tells us that Plato said that God was always geometricising.² In other words, the purely

¹ Cf. above the chapter on "The Apriori and the Purely Formal."

² Plutarchus *Convivia*, VIII., 2: πῶς Πλάτων ἔλεγε τὸν Θεὸν ἀεὶ γεωμετρεῖν. Having hunted in vain for the famous passage, I am indebted for the reference to Professor Ziwet of Ann Arbor, Mich.

formal theorems of mathematics and logic are the thoughts of God. Our thoughts are fleeting, but God's thoughts are eternal and omnipresent verities. They are intrinsically necessary, universal, immutable, and the standard of truth and right.

We repeat, matter is eternal and energy is indestructible, but there is nothing divine in either matter or energy. That which constitutes the divinity of the world is the eternal principle of the laws of existence. That is the creator of the cosmos, the norm of truth, and the standard of right and wrong. If incarnated in living beings, it produces mind, and it continues to be the source of inspiration for aspiring mankind, a refuge of the struggling and storm-tossed sailors on the ocean of life, and the holy of holies of the religious devotee and worshipper.

The norms of logic and of mathematics are uncreate and uncreatable, they are irrefragable and immutable, and no power on earth or in heaven can change them. We can imagine that the world was made by a great world builder, but we cannot think that logic or arithmetic or geometry was ever fashioned by either man, or ghost, or god. Here is the rock on which the old-fashioned theology and all mythological God-conceptions must founder. If God were a being like man, if he had created the world as an artificer makes a tool, or a potter shapes a vessel, we would have to confess that he is a limited being. He would be infinitely greater and more powerful than man, but he would, as much as man, be subject to the same eternal laws, and he would, as much as human inventors and manufacturers, have to mind the multiplication tables, the theorems of mathematics, and the rules of logic.

Happily this conception of the deity may fairly well be regarded as antiquated. We know now that God is not a big individual, like his creatures, but that he is God, creator, law, and ultimate norm of everything. He is not personal but superpersonal. The qualities that characterise God are omnipresence, eternity, intrinsic necessity, etc., and surely wherever we find them we should take off our shoes, for whenever we face eternal verities it is a sign that we are in the presence of God,—not of a mythological God, but the God of the cosmic order, the God of mathematics and

science, the God of ethics. So long as we can trace law in nature, as there is a norm of truth and untruth, and a standard of right and wrong, we need not turn atheists, even though the traditional conception of God is not yet free from crudities and mythological adornments. It will be by far preferable to purify our conception of God and replace the traditional notion which during the unscientific age of human development served man as a useful surrogate, by a new conception of God, that should be higher, and nobler, and better, because truer.

EDITOR.

CAGLIOSTRO—A STUDY IN CHARLATANISM.

"Mundus vult decipi, ergo decipiatur."—
Latin Proverb.

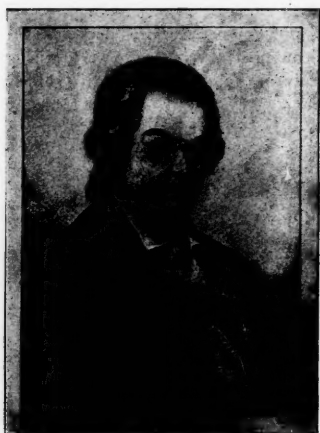
"The pseudo-mystic, who deceives the world because he knows that the world wishes to be deceived, becomes an attractive subject for psychological analysis."—Hugo Münsterberg: *Psychology and Life.*

I.

MY favorite haunt in Paris is the Quai Voltaire, because of the delightful book-stalls that line its parapet, presided over by the quaintest of Norman bouquinistes. The second-hand literature of the world may be found here. Amid the flotsam and jetsam of old books tossed upon this inhospitable shore of literary endeavor, many a precious Elzevir and Aldus has been picked up. On a pleasant summer day, while strolling along the Quai, I chanced upon a rare volume, entitled: *Vie de Joseph Balsamo, connu sous le nom de Comte Cagliostro. Traduite d'après l'original italien, imprimée à la chambre Apostolique; enrichie de notes curieuses, et ornée de son portrait. Paris et Strasbourg, 1791.* Yes, here was the biography of the famous necromancer of the old régime, the prince of charlatans, who foretold the fall of the Bastille, the bosom friend of the Cardinal de Rohan, and founder of the Egyptian Rite of Freemasonry. Fascinated with the subject of magic and magicians, I visited the Bibliothèque Nationale and dipped into the literature on Cagliostro. Subsequently, at the British Museum, I examined the rare brochures and old files of the *Courier de l'Europe* for information concerning the incomparable necromancer, who made use of hypnotism, and, like Mesmer, performed many strange feats of

pseudo-magic. Goethe and Catherine II. wrote plays about him, Alexander Dumas made him the hero of a dozen novels, and Thomas Carlyle philosophised concerning him. To understand Cagliostro, one must understand the times in which he lived and acted his strange world-drama, its philosophical and religious background.

The arch-enchanter appeared on this mortal scene when the times were "out of joint." It was the latter part of that strange, romantic eighteenth century of scepticism and credulity. The old



From a painting in the Versailles Historical Gallery.



After an engraving which served as a frontispiece of Balsamo's *Life*, published in 1791.

JOSEPH BALSAMO, KNOWN AS COUNT CAGLIOSTRO.

world like a huge Cheshire cheese was being nibbled away from within, until little but the rind was left to tell the tale. The rotten fabric of French society in particular was about to tumble down in the sulphurous flames of the Revolution, and the very people who were to suffer most in the calamity were doing their best to assist in the process of social and political disintegration, seemingly careless of the impending storm whose black clouds were slowly gathering. The more sceptical the age, the more credulity extant. Man begins by denying, and then doubts his doubts. Charles Kingsley says: "And so it befell, that this eighteenth century, which is usu-

ally held to be the most 'materialistic' of epochs, was in fact a most 'spiritualistic' one." The soil was well fertilised for the coming of Cagliostro, the sower of superstition. Every variety of mysticism appealed to the imaginative mind. There were societies of illuminati, Rosicrucians, alchemists, and Occult Freemasons.

Speaking of the great charlatan, the Anglo-Indian essayist Greeven says: "It is not enough to say that Cagliostro posed as a magician, or stood forth as the apostle of a mystic religion. After

M E M O I R E
POUR
LE COMTE DE CAGLIOSTRO,
A C C U S É;
CONTRE
M. LE PROCUREUR-GENÉRAL,
A C C U S A T E U R;

En présence de M. le Cardinal DE
ROHAN, de la Comtesse DE LA
MOTTE, et autres Co-Accusés.

M. DE CAGLIOSTRO NE DEMANDE QUE TRAN-
QUILLITÉ ET SURETÉ; L'HOSPITALITÉ
LES LUI ASSURE. *EXTRAIT d'une Lettre écrite*
par M. le Comte de VERGENNES, Ministre des
Affaires Étrangères, à M. GÉRARD, Préteur de
Strasbourg, le 13 Mars 1789.

1786.

TITLE-PAGE OF THE DEFENSE OF CAGLIOSTRO.

V I E
DE JOSEPH BALSAMO,
CONNU SOUS LE NOM
DE
COMTE CAGLIOSTRO,

Extrait de la Procédure instruite
contre lui à Rome, en 1790,

Traduite d'après l'original italien,
imprimé à la Chambre Apostolique;
enrichie de Notes curieuses, et ornée
de son Portrait.

A PARIS,

Chez OUDOT, libraire, rue Saint-Victor, n°. 11.

ET A STRASBOURG,

Chez JEAN-GEORGES TREUTTEL, libraire.

1791.

TITLE-PAGE OF THE LIFE OF CAGLIOSTRO.

all, in its mild way, our own generation puts on its evening dress to worship at the feet of mediums, whose familiar spirits enable them to wriggle out of ropes in cupboards, or to project cigarette papers from the ceiling [*à la* Madame Blavatsky]. We ride our hobby, however, only when the whim seizes us, and, as soon as it wearies, we break it in pieces and fling it aside with a laugh. But Cagliostro impressed himself deeply on the history of his time. He flashed on the world like a meteor. He carried it by storm. Princes and nobles thronged to his 'magic operations.' They prostrated

themselves before him for hours. His horses and his coaches and his liveries rivalled a king's in magnificence. He was offered, and refused, a ducal throne. No less illustrious a writer than the Empress of Russia deemed him a worthy subject of her plays. Goethe made him the hero of a famous drama. A French Cardinal and an English Lord were his bosom companions. In an age which arrogated to itself the title of *the philosophic*, the charm of his eloquence drew thousands to his Lodges, in which he preached the mysteries of his *Egyptian ritual*, as revealed to him by the Grand-Kophta under the shadow of the pyramids."

II.

And now for a brief review of his life. Joseph Balsamo, the son of Peter Balsamo and Felicia Braconieri, both of humble extraction, was born at Palermo, on the eighth day of June, 1743. He received the rudiments of an education at the Seminary of St. Roche, Palermo. At the age of thirteen, according to the Inquisition biographer, he was intrusted to the care of the Father-General of the Benfratelli, who carried him to the Convent of that Order at Cartagirone. There he put on the habit of a novice, and, being placed under the tuition of the apothecary, he learned from him the first principles of chemistry and medicine. He proved incorrigible and was expelled from the monastery in disgrace. Then began a life of dissipation in the city of Palermo. He was accused of forging theatre-tickets and a will. Finally he had to flee the city for having duped a goldsmith named Marano of sixty pieces of gold, by promising to assist him in unearthing a buried treasure by magical means. The superstitious Marano entered a cavern situated in the environs of Palermo, according to instructions given to him by the enchanter, and discovered, not a chest full of gold, but a crowd of Balsamo's confederates, who, disguised as infernal spirits, administered to him a terrible castigation. Furious at the deception, the goldsmith vowed to assassinate the pretended sorcerer. Balsamo, however, took wing to Messina, where he fell in with a strolling mountebank and alchemist named Althotas, or Altotas, who spoke a variety of languages. They travelled to Alexandria in

Egypt, and finally brought up at the island of Malta. Pinto, the Grand Master of the Knights of Malta, was a searcher after the philosopher's stone, an enthusiastic alchemist. He extended a warm reception to the two adventurers, and took them under his patronage. They remained for some time at Malta, working in the laboratory of the deluded Pinto. Eventually Althotas died, and Balsamo went to Naples, afterwards to Rome, where he married a beautiful girdle-maker, named Lorenza Feliciani. Together with a swindler calling himself the Marchese d'Agliata, he had a series of disreputable adventures in Italy, Spain, and Portugal.

Unmasked at one place he fled in hot haste to another. Behold him on his travels with coach-and-four, flunkies and outriders in gorgeous liveries, vehicles filled with baggage and paraphernalia; all alchemists, magicians, and masons must have paraphernalia—retorts, crucibles, alembics, baquets, disguises, mirrors, draperies, candelabra, sashes, swords, etc., etc. Best of all he carries with him an iron coffer, which contains the silver, gold, and jewels reaped from princely dupes. Behold the Arch-Master of Egyptian Masonry, the hero of the Pyramids, the Rosicrucian reputed to be able to make himself invisible, fleeing from the police in fashion prosaic.

In 1776 he arrived in London. He had assumed various aliases during the course of his life, but now he called himself the "Conte di Cagliostro," borrowed from an aunt, who bore the name without the title. His beautiful wife called herself the "Countess Serafina Feliciani." Cagliostro announced himself as a worker of wonders, especially in medicine. He carried about two mysterious substances—a red powder, known as his "Materia Prima," with which he transmuted baser metals into gold, and his "Egyptian Wine," with which he prolonged life.

He dropped hints that he was the son of the Grand-Master Pinto of Malta and the Princess of Trebizonde. He foretold the lucky numbers in a lottery and got into difficulty with a gang of swindlers, which caused him to flee from England to avoid being imprisoned. While in London he picked up, at a second-hand book-stall, the mystic writings of an obscure spiritist, one George

Cofton, or Coston, "which suggested to him the idea of the Egyptian ritual"; and he got himself initiated into a masonic lodge, so say the pamphleteers. It is asserted that he received the degrees of the Blue Lodge in the month of April, 1776, in the Esperance Lodge, No. 369, held at the King's Head Tavern; but there is no documentary evidence in support of this statement. It is difficult to say where Cagliostro was initiated into the degrees of freemasonry. I have had some correspondence with masonic scholars in England and on the Continent, but they have been able to shed no light on the subject. Cagliostro is regarded as the greatest masonic imposter of the world. His pretensions were bitterly repudiated by the English members of the fraternity, and many of the Continental lodges. But the fact remains that he made thousands of dupes. As Grand Master of the Egyptian Rite he leaped at once into fame. His swindling operations were now conducted on a gigantic scale. He had the entrée into the best society. According to him, freemasonry was founded by Enoch and Elias. It was open to both sexes. Its present form, especially with regard to the exclusion of women, is a corruption. The true form was preserved only by the Grand Kophta, or High Priest of the Egyptians. By him it was revealed to Cagliostro. The votaries of any religion are admissible, subject to these conditions, (1) that they believe in the existence of a God; (2) that they believe in the immortality of the soul; and (3) that they have been initiated into common Masonry. The candidate must swear an oath of secrecy, and obedience to the Secret Superiors. It is divided into the usual three grades of Apprentice, Fellowcraft, and Mastermason.

In this system he promised his followers "to conduct them to *perfection*, by means of a *physical and moral regeneration*; to enable them by the former (or physical) to find the *prime matter*, or Philosopher's Stone, and the *acacia*, which consolidates in man the forces of the most vigorous youth and renders them immortal; and by the latter (or moral) to procure them a Pantagon, which should restore man to his primitive state of innocence, lost by original sin."

The meetings of the Egyptian lodges were nothing more than

spiritualistic séances, during which communications were held with the denizens of the celestial spheres, and many mysteries unfolded of time and eternity. The medium was a young lad or a girl, who is in the state of innocence, called the *Pupil* or the *Colomb*. Cagliostro declared Moses, Elias, and Christ to be the Secret Superiors of the Order. "They have attained to such perfection in masonry that, exalted into higher spheres, they are able to create fresh worlds for the glory of the Lord. Each is still the head of a secret community."

No wonder the Egyptian Rite became popular among lovers of the marvellous, for it promised its votaries, who should attain to perfection, or adeptship, the power of transmuting baser metals into gold, or prolonging life indefinitely by means of an elixir; communion with the spirits of the dead, telepathy, etc.

Cagliostro often boasted of his great age. He claimed to have been one of the guests at the marriage feast at Cana and to have witnessed the Crucifixion. From England he went to the Hague, where he inaugurated a lodge of female masons, over which his wife presided as Grand Mistress. Throughout Holland he was received by the lodges with masonic honors—beneath "arches of steel." He discoursed volubly upon magic and masonry to enraptured thousands. In March, 1779, he made his appearance at Mitau, in the Baltic Provinces, which he regarded as the stepping-stone to St. Petersburg. He placed great hope in Catherine II. of Russia—"the avowed champion of advanced thought." He hoped to promulgate widely his new and mysterious religious cult in the land of the Czars, with all the pomp and glamour of the East. The nobility of Kurland received him with open arms. Some of them offered to place him on the ducal throne, so he claimed. He wisely refused the offer. Cagliostro eventually made a fiasco at Mitau and left in hot haste. In St. Petersburg his stay was short. Catherine II. was too clever a woman to be his dupe. She ordered the charlatan to leave Russia, which he forthwith did. Prospects of Siberia doubtless hastened his departure. In May, 1780, he turned up at Warsaw. A leading prince lodged him in his palace. Here Cagliostro "paraded himself in the white

shoes and red heels of a noble." His spirit séances were not a success. He chose as his clairvoyant a little girl, eight years of age. After pouring oil into her hands, he closed her in a room, the door of which was hung with a black curtain. The spectators sat outside. He interrogated the child concerning the visions that appeared to her. Among other tests, he requested the spectators to inscribe their names on a piece of paper which he appeared to burn before their very eyes. Calling to the child that a note would flutter down at her feet, he requested her to pass it to him through the door. He passed his hand through the opening of the door to receive the note. In the next instant he produced a note closed with a freemason's seal, which contained the signatures of each of the spectators. This was nothing more than the trick of a prestidigitateur, such as was performed by Philadelphia and Pinetti, the two great sleight-of-hand artists of the period. The next day the clairvoyant confessed the fact that she had been tutored by the magician, and that the visions were but figments of the imagination. Cagliostro secured a new subject, a girl of sixteen, but had the folly to fall in love with his accomplice. In exasperation she repeated the confession of her predecessor. The Polish nobles now insisted that Cagliostro invoke the spirit of the Grand Kophta (the Egyptian High Priest). This séance took place "in a dark room, on a sort of stage, lit with two candles only, and filled with clouds of incense." The Grand Kophta appeared. Through the uncertain light the spectators beheld an imposing figure in white robes and turban. A snowy beard fell upon its breast.

"What see ye?" cried in a hoarse voice the sage of the pyramids.

"I see," replied a sceptical gentleman from the audience, "that Monsieur le Comte de Cagliostro has disguised himself with a mask and a white beard."

Everybody recognised the portly figure of the vision. A rush seemed imminent. Quick as thought, the Grand Kophta, by a wave of his hands, extinguished the two candles. A sound followed as the slipping off of a mantle. The tapers were relit. Cagliostro was observed sitting where the sage had disappeared.

At Wola, in a private laboratory, he pretended to transmute mercury into silver. The scene must have been an impressive one. Girt with a freemason's apron, and standing on a black floor marked with cabalistic symbols in chalk, Cagliostro worked at the furnace. In the gloom of twilight the proceedings were held. By a clever substitution of crucibles, Cagliostro apparently accomplished the feat of transmutation, but the fraud was detected the next morning, when one of the servants of the house discovered the original crucible containing the mercury, which had been cast upon a pile of rubbish by the pretended alchemist, or one of his confederates.

In September, 1780, Cagliostro arrived at Strasburg. Here he was received with unbounded enthusiasm. He lavished money right and left, cured the poor without pay, and treated the great with haughtiness. Just outside of the city he erected a country villa in Chinese architecture, wherein to hold his Egyptian lodges. This place was long pointed out as the Cagliostræum. The peasants are said to have passed it with uncovered heads, such were their admiration and awe of the great wonder-worker. At Strasburg resided at that time the Cardinal Louis de Rohan, who was anxious to meet the magician. Cagliostro, to whom the fact was reported, said: "If the Cardinal is sick, he may come to me and I will cure him; if he is well, he has no further need of me, nor I of him." Cardinal de Rohan, enormously rich, a libertine, an amateur dabbler in alchemy and the occult sciences, was now more anxious than ever to become acquainted with the charlatan. Such disdain on the part of a layman was a new experience to the haughty churchman. His imagination, too, was fired by the stories told of the enchanter. The upshot of it was that Cagliostro and the Cardinal became bosom friends. The prelate invited the juggler and his wife to live at his episcopal palace.

The Baroness Oberkirch who saw him there says in her memoirs: "No one can ever form the faintest idea of the fervor with which everybody pursued Cagliostro. He was surrounded, besieged; every one trying to win a glance or a word.... A dozen ladies of rank and two actresses had followed him in order to con-

tinue their treatment. . . . If I had not seen it, I should never have imagined that a Prince of the Roman Church, a man in other respects intelligent and honorable, could so far let himself be imposed upon as to renounce his dignity, his free will, at the bidding of a sharper."

Cagliostro said to the Cardinal one day: "Your soul is worthy of mine, and you desire to be the confidant of all my secrets." He presented the Cardinal with a diamond worth 20,000 francs which he pretended to have made, the churchman claiming to have been an eye-witness of the operation. The Cardinal said to the Baroness: "But that is not all; he makes gold: he has made five or six thousand francs worth before me, up there in the top of the palace. I am to have more; I am to have a great deal; he will make me the richest prince in Europe. These are not dreams, madame; they are proofs. And his prophecies that have come true! And the miraculous cures that he has wrought! [*He really cured the Cardinal of the asthma.*] I tell you, he is the most extraordinary man, the sublimest man in the world."

Finally he bade adieu to Strasburg, and set out for Lyons in great pomp, with lackeys, grooms, guards armed with battle-axes, and heralds garbed in cloth of gold, blowing trumpets. In the year 1785 he founded at Lyons the Lodge of Triumphant Wisdom, and made many converts to his mystical doctrines. The fame of his Egyptian masonry reached Paris and created quite a stir among the lodges. The chiefs of a masonic convocation assembled in Paris wrote to him for information concerning his new rite. He scornfully refused to have anything to do with them, unless they burned all their masonic books and implements as useless trash and acknowledged their futility, claiming that his Egyptian Rite was the only true freemasonry and worthy of cultivation among men of learning. His next move was to the French Capital.

Cagliostro's greatest triumph was achieved at Paris. A gay and frivolous aristocracy, mad after new sensations, welcomed the magician with open arms. The way had been paved for him by St. Germain and Mesmer. He made his appearance in the French Capital January 30, 1785. Fantastic stories were circulated about

him. The Cardinal de Rohan selected and furnished a hotel for him, and visited him three or four times a week, arriving at dinner time and remaining until an advanced hour in the night. It was said that the great Cardinal assisted the sorcerer in his labors, and many persons spoke of the mysterious laboratory where gold bubbled and diamonds sparkled in crucibles brought to a white heat. But nobody except Cagliostro, and perhaps the Cardinal, ever entered that mysterious laboratory. All that was known for a certainty was that the apartments were furnished with Oriental splendor, and that Count Cagliostro in a dazzling costume received his guests with kingly dignity, and gave them his hand to kiss. Upon a black marble slab in the antechamber carved in golden letters was the universal prayer of Alexander Pope. "Father of all! in every age," etc., the parody of which ten years later Paris sang as a hymn to the Supreme Being.

Says Funck-Brentano in *The Diamond Necklace*:¹ "At Paris Cagliostro showed himself what he had been at Strasburg, dignified and reserved. He refused with haughtiness the invitations to dinner sent to him by the Count of Artois, brother of the king, and the Duke of Chartres, prince of the blood. He proclaimed himself chief of the Rosicrucians, who regarded themselves as chosen beings placed above the rest of mankind, and he gave to his adepts the rarest pleasure. . . . To all who pressed him with questions as to who he was, he replied in a grave voice, knitting his eyebrows and pointing his forefinger towards the sky, 'I am he who is'; and as it was difficult to make out that he was 'he who is not,' the only thing was to bow with an air of profound deference.

"He possessed the science of the ancient priests of Egypt. His conversation turned generally on three points: (1) Universal Medicine, of which the secrets were known to him. (2) Egyptian Freemasonry, which he wished to restore, and of which he had just established a parent lodge at Lyons, for Scotch masonry, then predominant in France, was in his eyes only an inferior, degenerate form. (3) The Philosopher's Stone, which was to ensure the transmutation of all the imperfect metals into fine gold.

¹ Translated by H. S. Edwards, Philadelphia, 1901.

"He thus gave to humanity, by his universal medicine, bodily health; by Egyptian masonry, spiritual health; and by the philosopher's stone, infinite wealth." These were his principal secrets, but he had a host of others, that of predicting the winning numbers in lotteries; prophesying as to the future; softening marble and restoring it to its pristine hardness; of giving to cotton the lustre and softness of silk, which has been re-invented in our day by a chemical process.

Among the many stories told of Cagliostro, that of the supper in the hotel of the Rue Saint Claude, where the ghosts made merry, still holds the record. Six guests and the host took their places at a round table upon which there were thirteen covers. Each guest pronounced the name of the dead man whose spirit he wished to appear at the banquet table. Cagliostro, concentrating his mysterious forces, gave the invitation in a solemn and commanding tone. One after another the six guests appeared. They were the Duc de Choiseul, Voltaire, d'Alembert, Diderot, the Abbe de Voisenon, and Montesquieu.

"When the living diners recovered their breath, the conversation began, but, unfortunately for the great ghosts, the record of their conversation makes them talk stupid nonsense. Perhaps this may be taken as evidence of the theory that a man loses his head when he dies. At all events, the story created a sensation in Paris. It reached the court, and one evening, when the conversation turned upon the banquet of the ghosts, the king frowned, shrugged his shoulders, and resumed his game of cards. The queen became indignant, and forbade the mention of the name of the charlatan in her presence. Nevertheless, some of the light-headed ladies of the court burned for an introduction to the superb sorcerer. They begged Lorenza Feliciani to get him to give them a course of lectures or lessons in magic to which no gentlemen were to be admitted. Lorenza replied that he would consent, provided there were thirty-six pupils. The list was made up in a day, and a week afterward the fair dames got their first lesson. But they talked of it, and of course the story got loose. This caused another scandal, and consequently the first lesson was the last."

Cagliostro's Egyptian Rite of Masonry was well received in Paris, especially the lodge for ladies, which was presided over by the beautiful Lorenza, his wife. It was appropriately called *Isis*. Among the members of this female lodge were the Countesses de Brienne, Dessalles, de Polignac, de Brissac, de Choiseul, d'Espinchal, the Marchioness d'Avrincourt, and Mmes. de Loménie, de Genlis, de Bercy, de Trevières, etc.

Cagliostro lived like a lord, thanks to the revenues obtained from the initiates into his masonic rite, and the money which he unquestionably received from his dupe, the Cardinal de Rohan, who was magic mad.

"His wife," says a gossip writer, "was rarely seen, but by all accounts she was a woman of bewildering beauty, realising the Greek lines in all their antique purity and enhanced by an Italian expression. The most enthusiastic of her so-called admirers were precisely those who had never seen her face. There were many duels to decide the question as to the color of her eyes, some contending that they were black, and others that they were blue. Duels were also fought over a dimple which some admirers insisted was on the right cheek, while others said that the honor belonged to the left cheek. She appeared to be no more than twenty years old but she spoke sometimes of her eldest son, who was for some years a captain in the Dutch army."

The magician's sojourn in Paris caused the greatest excitement. Prints, medallions, and marble busts of him were to be seen everywhere. He was called by his admirers "the divine Cagliostro." To one of the old portraits was appended the following verse:

"De l'Ami des Humains reconnaissez les traits:
Tous ses jours sont marqués par de nouveaux bienfaits,
Il prolonge la Vie, il secourt l'indigence;
Le plaisir d'être utile est seul sa récompense."

Hats and neckties were named after him. In Paris as in Strasbourg, he gave away large sums of money to the poor and cured them of their ailments free of charge. His mansion was always crowded with noble guests. The idle aristocracy could find noth-

ing better to do than attend the spirit séances of the charlatan. The shades of Voltaire, Rousseau, and other dead celebrities were summoned from the "vasty deep," impersonated doubtless by clever confederates in the pay of Cagliostro, often aided by mechanical and optical accessories. The art of phantasmagoria, in which the concave mirror plays a part, was well known to the enchanter. The Count de Beugnot gives in detail, in his interest-



BUST OF CAGLIOSTRO.
After Houdon.
(In the possession of M. Storelli.)



CAGLIOSTRO
From *Vie de Joseph Balsamo, etc*
Paris, 1791.

ing autobiography, an account of Cagliostro's performances at the residences of Madame de la Motte and the Cardinal De Rohan. Abridged by Saint Amand, we have the following statement: "As a sorcerer, he [Cagliostro] had a cabalistic apparatus. On a table with a black cloth, on which were embroidered in red the mysterious signs of the highest degree of the Rosicrucians, there stood the

emblems; little Egyptian figures, old vials filled with lustral waters, and a crucifix very like, though not the same as, the Christian's cross; and there, too, Cagliostro placed a glass globe filled with clarified water. Before the globe he used to place a kneeling seer; that is to say, a young woman who, by supernatural powers, should behold the scenes which were believed to take place in the water within the magic globe."

In the mysticism of the twentieth century this would be called *Crystal Vision* or *Crystal Gazing*. Cagliostro added to the *mise-en-scène* of the occasion by appearing in gorgeous robes. He would make mesmeric passes over the youthful clairvoyant, and summon the geniuses of the earth, air, and water, and the angels of the spheres, to enter the globe. "The seer became convulsed, she ground her teeth, and exhibited every sign of nervous excitement. At last she saw and began to speak. What was taking place that very moment hundreds of miles from Paris, in Vienna or St. Petersburg, in Austria or Pekin," etc. "It would be hard," says Count Beugnot, "to believe that such scenes could have taken place in France at the end of the eighteenth century; yet they aroused great interest among people of importance in the Court and the town."

An interesting pen portrait of Cagliostro is contained in Beugnot's memoirs. The Count met the enchanter for the first time at the house of Madame de la Motte:

"Cagliostro was of medium height, rather stout, with an olive complexion, a very short neck, round face, two large eyes on a level with the cheeks, and a broad, turned-up nose.... His hair was dressed in a way new to France, being divided into several small tresses that united behind the head, and were twisted up into what was then called a club.

"He wore on that day an iron-gray coat of French make, with gold lace, a scarlet waistcoat trimmed with broad Spanish lace, red breeches, his sword looped to the skirt of his coat, and a laced hat with a white feather, the latter a decoration still required of mountebanks, tooth-drawers and other medical practitioners, who proclaim and retail their drugs in the open air. Cagliostro set off this

costume by lace ruffles, several valuable rings, and shoe-buckles which were, it is true, of antique design, but bright enough to be taken for real diamonds.... The face, attire, and the whole man made an impression on me that I could not prevent. I listened to the talk. He spoke some sort of medley, half French and half Italian, and made many quotations which might be Arabic, but which he did not trouble himself to translate. I could not remember any more of [his conversation] than that the hero had spoken of heaven, of the stars, of the Great Secret, of Memphis, of the high-priest, of transcendental chemistry, of giants and monstrous beasts, of a city ten times as large as Paris, in the middle of Africa, where he had correspondents."

III.

Cagliostro was at the height of his fame, when suddenly he was arrested and thrown into the Bastille. He was charged with complicity in the affair of the Diamond Necklace. Here is his own account of the arrest: "On the 22d of August, 1786, a commissarie, an exempt, and eight policemen entered my home. The pillage began in my presence. They compelled me to open my secretary. Elixirs, balms, and precious liquors all became the prey of the officers who came to arrest me. I begged the commissarie to permit me to use my carriage. He refused! The agent took me by the collar. He had pistols, the stocks of which appeared from the pockets of his coat. They hustled me into the street and scandalously dragged me along the boulevard all the way to the rue Notre-Dame du-Nazareth. There a carriage appeared which I was permitted to enter to take the road to the Bastille."

What was this mysterious affair of the Diamond Necklace which led to his incarceration in a state prison? In brief the story is as follows:

The court jeweler, M. Böhmer, had in his possession a magnificent diamond necklace, valued at 1,800,000 livres originally designed for the ivory neck of the fair but frail Madame Du Barry, mistress of Louis XV. But Louis—"the well beloved"—died before the necklace was completed; the Sultana went into exile, and

the unlucky jeweler found himself with the diamond collar on his hands instead of on the neck of the Du Barry. He was obliged to dispose of it, or become a bankrupt. Twice he offered it to Marie Antoinette, but she refused to purchase it, or permit her husband, Louis XVI., to do so, alleging that France had more urgent need of war ships than jewels. Poor Böhmer, distracted at her refusal to buy the necklace, threatened to commit suicide. The matter became food for gossip among the *quid nuncs* of the Court. Unfortunate necklace, it led to one of the most romantic intrigues of history, involving in its jeweled toils a Queen, a cardinal, an adventuress, a courtesan, and a conjurer. Living at the village of Versailles at the time was the Countess de la Motte, an ex-mantua maker, and a descendant of an illegitimate scion of the Valois family, who had committed a forgery under Louis XIII. Her husband was a sort of gentleman-soldier in the gendarmerie; a gambler and a rake. Madame de la Motte-Valois, boasting of the royal blood that flowed in her veins, had many times petitioned the King to assist her. A small pension had been granted, but it was totally inadequate to supply her wants. She wished also to gain a foothold at Versailles and flutter amidst the butterfly-countesses of the *Oeil de Boeuf*. Looking about for a noble protector, some one who could advance her claims, she pitched upon the Cardinal de Rohan who was Grand Almoner of the King. He supplied her with money, but accomplished very little else for her. Though Grand Almoner and a Cardinal, Louis de Rohan was *non persona grata* at the court. He was cordially detested by Marie Antoinette not only because of his dissolute habits, but on account of slanderous letters he had written about her when she was still a Dauphiness. This coldness on the part of the Queen caused the Cardinal great anguish, as he longed to be Prime Minister, and sway the destinies of France through the Queen like a second Mazarin. More than that he loved the haughty Antoinette. All these things he confided to Madame de la Motte. When the story of Böhmer and the Diamond Necklace was noised abroad, Madame de la Motte conceived a plot of wonderful audacity. She determined to possess the priceless collar and make the Cardinal the medium of obtaining it. She de-

luded the Cardinal into the belief that she was in the Queen's confidence. She asserted that Marie Antoinette had at last yielded to her pleadings for recognition as a descendant of the Valois and granted her social interviews. She confided to him that the Queen secretly desired to be reconciled to him. She became the pretended "go-between" between the Cardinal and the Queen, and delivered numerous little notes to him, signed "Antoinette de France." Finally she arranged an interview for him, at night, in the park of Versailles, ostensibly with the Queen, but in reality with a young girl named D'Oliva who bore a remarkable resemblance to Marie Antoinette. The D'Oliva saw him only for a few moments and presented him with a rose. The Cardinal was completely duped. "Madame de la Motte persuaded him," says Greeven, "into the belief that the Queen was yearning for the necklace, but, as she could not afford it, he could assure himself of her favor by becoming security for the payment. She produced a forged instrument, which purported to have been executed by the Queen, and upon which he bound himself as security." The necklace was delivered to the Cardinal, who handed it over to Madame de la Motte, to be given to Marie Antoinette.

But, asks the curious reader, what has all this to do with Cagliostro? What part had he to play in the drama? This: When the Comtesse de la Motte was arrested, she attempted to throw the blame of the affair upon the Cardinal and Cagliostro. She alleged that they had summoned her into one of their mystic séances. "After the usual hocus-pocus, the Cardinal made over to her a casket containing the diamonds without their setting, and directed her to deliver them to her husband, with instructions to dispose of them at once in London. Upon this information Cagliostro and his wife were arrested. He was detained, without hearing, from the 22d of August, 1785, until the 30th of January, 1786, when he was first examined by the Judges, and he was not set at liberty till the 1st of June, 1786."

The trial was the most famous in the annals of the Parliament. Cagliostro and the Cardinal were acquitted with honor. The Countess de la Motte was sentenced to be exposed naked, with a

rope around her neck, in front of the Conciergerie, and to be publicly whipped and branded by the hangman with the letter V (*Vo-leuse—thief*) on each shoulder. She was further sentenced to life imprisonment in the prison for abandoned women. She escaped from the latter place, however, to London, where she was killed on the 23d day of August, 1791, by a fall from a window. The Count de la Motte was sentenced *in contumacium*. He was safe in London at the time and had disposed of the diamonds to various dealers. The d'Oliva was set free without punishment. The man who forged the letter for Madame de la Motte, her secretary Vil-



MADAME DE LA MOTTE'S ESCAPE. (After an English print of 1790.)

lette, was banished for life. Countess Cagliostro was honorably discharged.

The Cardinal was unquestionably innocent, as was fully established at the trial. His overweening ambition and his mad love for Marie Antoinette had rendered him an easy dupe to the machinations of the De la Mottes. But how was it with Cagliostro? The essayist Greeven, in an article published a few years ago in the *Calcutta Review*, seems to think that the alchemist was more or less mixed up in the swindle. He sums up the suspicions as follows: "First, his [Cagliostro's] immense influence over the Cardinal, and his intimate relations with him, render it impossible that

so gigantic a fraud could have been practiced without his knowledge. *Second*, he was in league with the Countess for the purpose of deceiving the Cardinal, in connection with the Queen." M. Frantz Funck-Brentano, in his admirable history of the Diamond Necklace, based upon documents recently discovered in Paris [page 283, Edwards's translation, Philadelphia, 1901]: "The idea of implicating Cagliostro in the intrigue had been conceived, as Georgel says, with diabolical cunning. If Jeanne de Valois had in the first instance made a direct accusation against Cardinal de Rohan, no one would have believed in it. But there was something mysterious and suspicious about Cagliostro, and it was known what influence he exercised on the mind of the Cardinal. 'The alchemist,' she suggested, 'took the necklace to pieces in order to increase by means of it the occult treasures of an unheard-of fortune.' 'To conceal his theft,' says Doillot [Madame de la Motte's lawyer], 'he ordered M. de Rohan, in virtue of the influence he had established over him, to sell some of the diamonds and to get a few of them mounted at Paris through the Countess de la Motte, and to get more considerable quantities mounted and sold in England by her husband.' . . . Cagliostro had one unanswerable argument: the Cardinal had made his agreement with the jewelers on the 29th of January, 1785, and he, Cagliostro, had only arrived in Paris at nine in the evening of the 30th."

Cagliostro refuted the charges with wonderful *sang froid*. He appeared in court "proud and triumphant in his coat of green silk embroidered with gold." "Who are you? and whence do you come?" asked the attorney for the crown.

"I am an illustrious traveller," he answered bombastically. Every one present laughed.

Cagliostro drove in triumph from the court house to his residence, after hearing his order of discharge. His coach was preceded by "a fantastic cripple, who distributed medicines and presents among the crowd." He found the Rue St. Claude thronged with friends and sympathisers, anxious to welcome him home. At this period revolutionary sentiments were openly vented by the people of France. The throne was being undermined by the phi-

losophers and politicians. Any excuse was made to revile Louis XVI. and his queen. Scurrilous pamphlets were published declaring that Marie Antoinette was equally guilty with the de la Mottes in the necklace swindle. Cagliostro consequently was regarded as a martyr to the liberties of man. His arrest under the detested *lettre-de-cachet*, upon mere suspicion, and long incarceration in the Bastille without trial, were indeed flagrant abuses of justice and gave his sympathisers a whip with which to lash the King and Court.

His wife had been liberated some time before him. She met him at the door of the temple of magic, and he swooned in her arms. Whether this was a genuine swoon or not, it is impossible to say, for Cagliostro was ever a *poseur* and never neglected an opportunity for theatrical effect and self-advertisement. He accused the Marquis de Launay, Governor of the Bastille—he who had his head chopped off and elevated upon a pike a few years later—of criminal misappropriation of his effects, money, medicines, alchemical powders, elixirs, etc., etc., which he valued at a high sum. The Commissioner of Police who arrested him was also included in this accusation. He appealed to his judges, who referred him to the Civil Courts. But the case never came to trial. The day after his acquittal he was banished from France by order of the King. At St. Denis, "his carriage drove between two dense and silent lines of well-wishers, while, as his vessel cleared from the port of Boulogne, five thousand persons knelt down on the shore to receive his blessing." He went direct to London. No sooner there, than he filed his suit against the Marquis de Launay, "appealing, of course, to the hearts of all Frenchmen as a lonely and hunted exile." The French Government, through its ambassador, granted him leave to come in person to Paris to prosecute his suit, assuring him of safe conduct and immunity from all prosecution, legal as well as social. But Cagliostro refused this offer, hinting that it was merely a stratagem to decoy him to Paris and reincarcerate him in a dungeon. No clear-headed, impartial person believed that the Marquis de Launay was guilty of the charge laid at his door. Whatever else he may have been, tyrannical, cold, unsympathetic, the

Governor of the Bastille was a man of honor and above committing a theft. In fact, Cagliostro's accusation was a trumped-up affair, designed to annoy and keep open "a running sore in the side of the French authorities." Notoriety is the life of charlatanry. Cagliostro was no common quack, as his history shows. He next published a pamphlet, dated June 20th, 1786, prophesying that the Bastille would be demolished and converted into a public promenade; and, that a ruler should arise in France, who should abolish *lettres de cachet* and convoke the Estates-General. In a few years the prediction was fulfilled. Poor De Launay lost his life, whereupon Cagliostro issued a pamphlet exulting over the butchery of his enemy. In London, Cagliostro became the bosom friend of the eccentric Lord George Gordon. Eventually he became deeply involved in debt, and was obliged to pawn his effects. He was unable to impress the common-sense, practical English with his pretensions to animal magnetism, transcendental medicine, and occultism. One of his vaunted schemes was to light up the streets of London with sea water, which by his magic power he proposed to change into oil. The newspapers ridiculed him, especially the *Courier de l'Europe*, published and edited by M. Morande, who had "picked up some ugly facts about the swindler's early career." The freemasons repudiated him with scorn, and would have nothing to do with his Egyptian Rite. There is a rare old print, a copy of which may be seen in the Scottish Rite Library, Washington, D. C., which depicts the unmasking of the famous imposter at the Lodge of Antiquity, published Nov. 21, 1786, at London. It was engraved by an eye-witness of the scene. In company with some French gentlemen, Cagliostro visited the Lodge one evening. At the banquet which followed the working of the degree, a certain worthy brother named Mash, an optician, was called upon to sing. Instead of a post-prandial ditty, he gave a clever imitation of a quack doctor selling nostrums, and dilating bombastically upon the virtues of his elixirs, balsams (Balsamos), and cordials. Cagliostro was not slow in perceiving that he was the target for Brother Mash's shafts of ridicule. His "front of brass," as Carlyle has it, was beaten in, his pachyderm was penetrated by the barbed arrows

of the ingenious optician's wit. He left the hall in high dudgeon, followed by the jeers of the assembled masons. Alas, for the Grand Kophta, no "vaults of steel," no masonic honors for him in London.



CAGLIOSTRO UNMASKED AT THE LODGE OF ANTIQUITY, LONDON.
From a rare print in the possession of the Supreme Council, A. A. S. R., Washington, D. C.

The verse appended to the engraving of Cagliostro and the English lodge is as follows :

" Born, God knows where, supported, God knows how,
From whom descended, difficult to know.
Lord Crop adopts him as a bosom friend,
And manly dares his character defend.

This self-dubb'd Count, some few years since became
 A Brother Mason in a borrow'd name ;
 For names like *Semple* numerous he bears,
 And Proteus like, in fifty forms appears.
 'Behold in me (he says) Dame Nature's child,
 'Of Soul benevolent, and Manners mild ;
 'In me the guiltless Acharat behold,
 'Who knows the mystery of making Gold ;
 'A feeling heart I boast, a conscience pure,
 'I boast a Balsam every ill to cure ;
 'My Pills and Powders, all disease remove,
 'Renew your vigor, and your health improve.'
 This cunning part the arch imposter acts,
 And thus the weak and credulous attracts,
 But now, his history is rendered clear,
 The arrant hypocrite, and quack appear.
 First as *Balsams*, he to paint essay'd,
 But only daubing, he renounc'd the trade.
 Then, as a Mountebank, abroad he stroll'd
 And many a name on Death's black list enroll'd.
 Three times he visited the British shore,
 And every time a different name he bore.
 The brave Alsatians he with ease 'cajol'd
 By boasting of Egyptian forms of old.
 The self-same trick he practis'd at Bourdeaux,
 At Strasburg, Lyons, and at Paris too.
 But fate for *Brother Mash* reserv'd the task
 To strip the vile impostor of his mask,
 May all true Masons his plain tale attend
 And Satire's lash to fraud shall put an end."

To escape the harpies of the law, who threatened him with a debtor's prison, Cagliostro fled to his old hunting-ground, the Continent, leaving *la petite Comtesse* to follow him as best she could. But the game was played out. The police had by this time become fully cognisant of his impostures. He was forbidden to practise his peculiar system of medicine and masonry in Austria, Germany, Russia, and Spain. Drawn like a needle to the lodestone rock, he went to Rome. Foolish Grand Kophta ! Freemasonry was a capital offence in the dominions of the Pope. One lodge, however, existed. Says Greeven : "There is reason to suppose that it was

tolerated only because it enabled the Holy Church to spy out the movements of freemasons in general." Cagliostro attempted to found one of his Egyptian lodges, but met with no success. His exchequer became depleted. He appealed to the National Assembly of France to revoke the order of banishment, on the ground of "his services to the liberty of France." Suddenly on the evening of Dec. 27, 1789, he and his wife were arrested and incarcerated in the fortress of San Angelo. His highly-prized manuscript of Egyptian masonry was seized, together with all his papers and correspondence. He was tried by the Holy Inquisition. It must have been an impressive scene—that gloomy council chamber with the cowed inquisitors. Cagliostro's wife appeared against him and lifted the veil of Isis that hid the Mysteries of the Charlatan's career. The Egyptian manuscript of unknown George Coston, the seals, the masonic regalia and paraphernalia were mute and damning evidences of his guilt. He was indeed a freemason, even though he were not an alchemist, a soothsayer, the Grand Kophta of the Pyramids. Cagliostro's line of defence was that "he had labored throughout to lead back freemasons, through the Egyptian ritual to Catholic orthodoxy." He appeared at first to be contrite. But it availed him nothing. Finding his appeals for mercy useless, he adopted another tack, and told impossible stories of his adventures. He harangued the Holy Fathers for hours, despite their threats and protests. Nothing could stop his loquacious tongue from wagging. Among other Münchhausen tales, he related how he had visited the Illuminati of Frankfurt, when on his way to Strasburg. In an underground cavern, the secret Grand Master of Templars "showed him his signature under a horrible form of oath, traced in blood, and pledged him to destroy all despots, especially in Rome." Finally, he was condemned to death as a heretic, sorcerer, and freemason, but Pope Pius VI., on the 21st of March, 1791, commuted the sentence to life imprisonment. His manuscript was declared to be "superstitious, blasphemous, wicked, and heretical," and was ordered to be burnt by the common hangman, together with his masonic implements. From San Angelo, Cagliostro was conducted to the Castle of San Leon, Urbino. Here, in

a subterranean dungeon, he fretted away his life in silence and darkness, until 1795, when he died. A French inspector of Italian prisons, who visited the fortress of San Leon, March 6, 1795, reported that he saw a sentence and autograph scribbled upon the dungeon wall by Cagliostro. No one knows where the arch-enchanter is buried. His wife ended her days in a convent.

In the Inquisition biography some curious letters to Cagliostro from his masonic correspondents in France are published. They evidence the profound respect, one might almost say blind worship, with which he was regarded by his disciples.

The masonic lodge at Rome was disrupted shortly after Cagliostro's arrest. The Sbirri of the Holy Office pounced down upon it, but the birds had flown, taking with them their most important papers. Father Marcellus says that among the members of this Roman lodge were an Englishman and an American.

And so endeth the career of Cagliostro, one of the most romantic of history. His condemnation as a sorcerer and freemason has invested him with "the halo of a religious martyr, of which perhaps no one was less deserving."

Among his effects was found a peculiar seal, upon which were engraved the mysterious letters "L. P. D." These letters are supposed to stand for the Latin sentence, "*Lilia pedibus destrue*," which translated signifies: "Tread the lilies under foot,"—alluding to the overthrow of the French monarchy.

Many theosophical writers have placed implicit belief in the mission of Cagliostro as the secret agent of an occult brotherhood working for human liberty and regeneration.

Taking this idea for a theme, Alexander the Great—he of the pen, not of the sword—has built up a series of improbable though highly romantic novels about the personality of Cagliostro, entitled *The Memoirs of a Physician*, and *The Diamond Necklace*. He makes him the Grand Kophta of a society of Illuminati, or exalted Freemasons, which extends throughout the world. Pledged to the spread of equality, fraternity, and liberty among men, the Brotherhood seeks to overthrow the thrones of Europe, symbols of oppression and persecution. *The Memoirs of a Physician* opens with a re-

markable prologue, descriptive of a solemn conclave of the secret superiors of the Order. The meeting takes place at night in a ruined chateau located in a mountainous region near the old city of Strasbourg. Cagliostro reveals his identity as the Arch-master of the Fraternity, the Grand Kophta, who is in possession of the secrets of the pyramids. He takes upon himself the important task of "treading the lilies under foot" and bringing about the destruction of the monarchy in France, the storm-centre of Europe. He departs on his mission. Like Torrini, the conjurer, he has a miniature house on wheels drawn by two Flemish horses. One part of the vehicle is fitted up as an alchemical laboratory, wherein the sage Althotas makes researches for the elixir of life. Arriving at the chateau of a nobleman of the *ancien régime*, Cagliostro magnetises a young lady and causes her to see in a carafe of water the death of Louis XVI. and Marie Antoinette by the guillotine. Aided by the free-masons of Paris, Cagliostro sets to work to encompass the ruin of the throne and to bring on the great Revolution. Dumas in this remarkable series of novels passes in review before us Jean Jacques Rousseau, Cardinal de Rohan, Louis XV. and XVI., Marie Antoinette, Comtesse du Barry, Madame de la Motte, Danton, Marat, and a host of people famous in the annals of history. Cagliostro is exalted from a charlatan into an apostle of liberty endowed with many noble qualities. He is represented as possessing occult powers, and his séances are depicted as realities. Dumas himself was a firm believer in spiritualism, and hobnobbed with the American medium Daniel D. Home.

Cagliostro's house in the Marais quarter, Paris, still remains—a memorial in stone of its former master. In the summer of 1899 the *Courier des États Unis*, New York, contained an interesting article on this mansion. I quote as follows:

"Cagliostro's house still stands in Paris. Few alterations have been made in it since the days of its glories and mysteries; and one may easily imagine the effect which it produced in the night upon those who gazed upon its strange pavilions and wide terraces when the lurid lights of the alchemist's furnaces streamed through the outer window blinds. The building preserves its noble lines in spite of modern additions and at the same time has a weird appearance which produces an almost depressing effect. But this doubtless comes from the imagination, be-

cause the house was not built by Cagliostro; he simply rented it. When he took up his quarters in it, it was the property of the Marquise d'Orvillers. Cagliostro made no changes in it, except perhaps a few temporary interior additions for the machines which he used in his séances in magic.

"The plan of the building may well be said to be abnormal. The outer gate opens upon the rue Saint Claude at the angle of the boulevard Beaumarchais. The courtyard has a morose and solemn aspect. At the end under a flagged porch there is a stone staircase worn by time, but it still preserves its old iron railing. On looking at that staircase, one cannot help thinking of the hosts of beautiful women, attracted by curiosity to the den of the sorcerer, and terrified at what they



COURTYARD OF CAGLIOSTRO'S HOUSE IN PARIS (PRESENT CONDITION).

imagined they were about to see, who placed their trembling hands upon that old railing. Here we can evoke the shade of Mme. de la Motte running up the steps, with her head covered with a cloak, and the ghosts of the valets of Cardinal de Rohan sleeping in the driver's seat of the carriage with a lantern at their feet, while their master, in company with the Great Kophta, is occupied with necromancy, metallurgy, cabala, or oneirocritics, which, as everybody knows, constitute the four elementary divisions of Cagliostro's art.

"A secret stairway now walled up ran near the large one to the second story, where its traces are found; and a third stairway, narrow and tortuous, still exists at the other end of the building on the boulevard side. It is in the center of the

wall, in complete darkness, and leads to the old salons now cut into apartments, the windows of which look out upon a terrace. Below, with their mouldering doors, are the carriage house and the stable,—the stable of Djérid, the splendid black horse of Lorenza Feliciani."

To verify the above statement, I wrote to M. Alfred de Ricaudy (an authority on archæological matters and editor of *L'Echo du Public*, Paris), who responded as follows, Jan. 13, 1900:

"The house still exists just as it was in the time of Cagliostro [the exterior]. Upon the boulevard, contiguous to the mansion, there was formerly the shop of one Camerlingue, a bookseller, now occupied by an upholsterer. On January 30, 1789, Cagliostro took up his residence in this quaint old house. It was then No. 30 Rue St. Claude, at the corner of the Boulevard Saint Antoine, afterwards the Boulevard Beaumarchais. The Marquise d'Orvillers was the owner of the premises occupied by the thaumaturgist of the eighteenth century. Her father, M. de Chavigny, captain in the royal navy, had built this house on ground acquired in 1719 from Mme. de Harlay, who had inherited it from her father, le Chevalier Boucherat. (See Lefeuve, *Old House of Paris*, Vol. IV., issue 51, page 24, published by Achille Faure, Paris, 1863.)"

Cagliostro's house is now No. 1, the numbering of the street having been altered during the reign of Louis Philippe. Says M. de Ricaudy:

"The numbering originally began at the Rue Saint Louis, now Rue de Turenne, in which is situated the church Saint Dennis du St. Sacrement. When the houses were re-numbered with reference to the direction of the current of the Seine (under Louis Philippe), the numbers of the Rue St. Claude, which is parallel to the river, began at the corner of the boulevard, and in that way the former number 30 became number 1."

The sombre old mansion has had a peculiar history. Cagliostro locked the doors of the laboratories and séance-rooms on the 13th of June, 1788, on the occasion of his exile from France. All during the great Revolution the house remained closed and intact. Eighteen years of undisturbed repose passed away. The dust settled thick upon everything; spiders built their webs upon the gilded ceilings of the salons. Finally, in the Napoleonic year 1810, the doors of the temple of magic and mystery were unfastened, and the furniture and rare curios, the retorts and crucibles, belonging to the dead conjurer were auctioned off. An idle crowd of curious *quid nuncs* gathered to witness the sale, and pry about. Says Ricaudy:

"The household furniture, belongings, etc., of the illustrious adventurer were not sold until five years after his death. The sale took place in the apartment which he had occupied, and was by order of the municipal government. An examination revealed many curious acoustical and optical arrangements constructed in the building by Cagliostro. By the aid of these contrivances and that of well-trained confederates, he perpetrated many supposedly magical effects, summoned the shades of the dead," etc. (See *Dictionnaire de la France*. By A. G. de St. Fargeau, Vol. III., page 245. Paris, 1851.)

The writer of the article in the *Courier des États Unis* further states:

"Since the auctioning of Cagliostro's effects the gloomy house of the Rue St. Claude has had no history. Ah, but I am mistaken. In 1855 some repairs were made. The old carriage door was removed, and the one that took its place was taken from the ruins of the Temple. There it stands to-day with its great bolts and immense locks. The door of the prison of Louis XVI. closes the house of Cagliostro."

M. de Ricaudy verifies this statement about the door of the mansion. The student of Parisian archæology will do well to consult M. de Ricaudy, as well as M. Labreton, 93 Boulevard Beaumarchais, who possesses forty volumes relating to the history of the Marais Quarter. Last but not least is the indefatigable student of ancient landmarks of Paris, M. G. Lenôtre, author of *Paris révolutionnaire, vieilles maisons, vieux papiers*.

My friend, M. Félicien Trewéy, who visited the place in the summer of 1901, at my request reported to me that it had been converted into a commercial establishment. A grocer, a feather curler, and a manufacturer of cardboard boxes occupied the building, oblivious of the fact that the world-renowned Cagliostro once lived there, plying his trade of sorcerer, mesmerist, physician, and mason, like a true *chevalier d'industrie*. Alas! the history of these old houses! They have their days of splendid prosperity, followed by shabby gentility and finally by sordid decay,—battered, bleary-eyed, and repulsive-looking.

HENRY RIDGELY EVANS.

WASHINGTON, D. C.

PHILOSOPHY IN ITALY.

ITALIAN philosophy is very little known, even in Italy. No complete history of it exists, and one is compelled to resort for information concerning it to sketches of particular periods or to monographs on schools and individuals.

The reason of this neglect is to be sought mainly in the psychological constitution of our race. The Italians are not, like the Germans, a nation of thinkers; as a rule they lack the taste for general abstractions and ideas, which is the primal source of philosophy. The two salient aspects of their activity, particularly if we review their past, are practical life and art. They love action; they have produced successful merchants, adventurous travellers, statesmen and warriors; they love reality; they have had a brilliant succession of scientists and inquirers; they love beauty; and they boast of the greatest artists the world has produced. Adding to this their love of tradition and of their past, which has produced long generations of historians and scholars, and at times a hyperæsthesia of the religious sentiment, we have a pretty complete picture of the tendencies of the Italian mind. Love of pure thought, of abstraction, and of generalisation is absent, at least in the great majority of cases.

Yet, despite this inaptitude for speculative thinking, Italy has had some very distinguished philosophers,—a fact which is not in contradiction with what I have just laid down. The great philosophers of Italy appeared spasmodically (for example, Bruno, Vico); they possessed in a high degree the qualities of observation of their race (for example, Galileo); sometimes they drew their inspiration from foreign philosophers (for example, Rosmini and Gioberti).

Many of them were compelled to leave their native country in search of a clime more favorable to abstract thought, and even to this day there are some who are more studied abroad than at home.

To the psychological causes of the lack of speculation in Italy are to be added two historical causes: (1) The perpetual dismemberment of Italy, which never permitted the formation of a single center of culture; and (2) the presence of the Catholic Church.

But the first consideration has not much weight, since we have had in Italy centers for law (Bologna), for medicine (Salerno, Pisa), for natural sciences (Padua); and nothing should have prevented the formation of a real center of philosophy, whereas in fact we have only had transitory groups (Padua, Florence, Naples). And one could also advert to the fact that the political dismemberment of Germany, although greater than that of Italy, did not prevent the development of a Leibnitz and a Kant.

The influence of the Roman Church has been more powerful, and, as it would seem, more pernicious. It is true, at the beginning of the Renaissance, Rome was comparatively tolerant and permitted philosophers to carry on their discussions without greatly molesting them. It was not until after the Reformation that the popes drew the bonds tighter and began their persecutions. With the seventeenth century the counter-reformation triumphed in Italy and original speculation almost entirely vanished. This is a coincidence that has impressed historians who like to see in the suppression of the Reformation in Italy almost the sole cause of the decline of speculative thought. Doubtless this was an important factor, and it is to be remembered that in the Teutonic countries the Reformation induced habits of intellectual liberty which have exercised a most beneficent influence on the progress of thought. But the psychological causes, which go deeper, must also not be forgotten. If Italy did not embrace the Reformation, her action was not solely due to the great power of the Church. Attempts to establish it were not wanting, and recently M. Ruffini has shown that the principle of religious liberty was carried to the North by Ital-

ians,—Socinians. But the mass of the people was not a favorable medium for the new ideas.

The people of Italy take, we must admit, little interest in things of the intellect; it is practical, and the Church is a source of gain and of employment for it. It is artistic, and it has no mind to renounce the pomps of the Church, the paintings of Raphael, and the sculptures of Michael Angelo. Its concern is with outward things, and it troubles itself little about intellectual freedom. It is on occasions a trifle sluggish, and has no desire to torture its brain with the Holy Scriptures.

The suppression of the Reform was therefore an effect, and not a first cause. Italy has not had a national philosophy for the reason that its inhabitants are no lovers of general ideas. This explanation, which may recall that of M. de la Palisse, is nevertheless the most ultimate one that can be given, because it is derived from ultimate psychological elements. Thus is explained the want of connection and sequence in the Italian Systems, much as we should like to find it. An ingenious positivist writer, M. Puglia, concludes naturally enough that the character of Italian philosophy is positivistic, just as others have shown that it is religious or idealistic in character.

We must repeat that the philosophy of Italy as a continuous and organic production does not exist; we can speak only of philosophers who were born in Italy and have written in Italian,—nothing more. The philosophical groups—the Averroism of Padua, the Platonism of Florence, the Hegelianism of Naples—did not long endure and were the fruits of importation.

Nevertheless, the history of philosophy in Italy is very interesting, and it is to be regretted that it has not been more cultivated. If to-day Italy is not one of the three great centres of philosophy (themselves not at present extraordinarily brilliant), it has been so in the past and was alone so during two centuries, the fifteenth and the sixteenth; and it is to be borne in mind that one of the greatest movements of modern thought, Experimentalism, was established and developed in Italy before appearing in any other country.

The political unification of Italy (1860-1870) imparted a new impetus to the study of the sciences, and it would seem from certain indications that philosophy is also gaining in esteem among the educated Italians who are now coming more and more in contact with foreign influence. We shall learn in a forthcoming paper to what extent this is true, while in the present we shall endeavor to trace the development of Italian philosophy to the time of the proclamation of our national unity (1870), seeing whether it corroborates our introductory remarks.

I.

THE MIDDLE AGES (V.-XIV. CENTURIES).¹

How did Italian philosophy begin? This is a question that has been long debated and which still awaits solution. Some writers would have it commence with the first philosophers of Magna Græcia, with the Pythagoreans (Bartholmess, Poli, and Puglia); others with Boetius and the Middle Ages (Siciliani), or with the Renaissance (Fiorentino).

We shall dismiss classical antiquity altogether. The philosophical schools of southern Italy are intimately connected with the development of Greek thought, and there is only a geographical reason for separating them. The Romans, we know, had no original philosophy. They merely echoed Greek thought with more or less fidelity. We find them Epicurean with Lucretius, Stoical with Seneca and Marcus Aurelius, and Eclectic with Cicero, —never Italian or Roman. They left us in their works valuable sources of knowledge for the ancient philosophy, but they never enriched human thought with a single new idea. They were excellent soldiers, skilful administrators, but very mediocre thinkers. M. Puglia is of the opinion that the real philosophy of the Romans was their jurisprudence, but this cannot, I think, be classified without violence as a branch of speculation properly so called, and is

¹General sketches: B. Poli, *Filosofi italiani* (supplement to the Italian trans. of Tennemann, Milan, 1836 and 1855); F. Bertinaria, *Dell'indole e delle vicende della filos. ital.*, Turin, 1846; Predari, *Carattere e sviluppo della filos. ital.* (*Saggi di Critica*, Naples); F. Puglia, *L'evoluz. nella storia dei sistemi filosofici italiani* (*Archiv f. Gesch. d. Philos.*, 1888, B. I., Heft 2), new edition, Naples, 1890.

on the contrary rather a new proof of the practical and therefore anti-speculative tendencies of the ancient masters of the world.

Nevertheless, I should not place the beginnings of Italian philosophy in the Middle Ages, at least not in the late Middle Ages. Italy, like all other countries of the Occident, suffered two invasions: the spiritual Christian invasion of the Orient and the human barbarous invasion of the North. After five centuries (the 1st to the 5th), it ceased to be a sovereign pagan country. Slowly the ancient culture disappeared. Boetius (470-524) and Cassiodorus (480-575) are pious Christians who still know the ancient philosophies; but after them comes the darkness of night. Rome is no longer the capital of the world, and the new Italian nationality has not yet formed. Greek philosophy is buried and unknown, and Christian philosophy is still in its swaddling clothes. It is a long period of transition during which the invasions cease, a new society is formed, the races intermingle and fuse, the Church is organised, a profound faith produces hymns and heresies, but no explanations or rebellions. There is as yet no need of justifying the dogmas. The energies of teachers were restricted to expounding them, or at most to defending them against heterodox doctrines. There are a few moralists,—Gregory the Great who died in 604, Acton (10th century), or some theologians,—Peter of Pisa, Paolino of Aquileia (8th century); but we find nothing that could justly be called philosophy.

The formation of the Italian nationality occupies about four centuries (the 9th to the 11th). We have the first Italian kings in the 9th century, the first independent communes in the 11th century, and their struggles, sometimes successful, with the German emperors from the 11th to the 13th centuries. The language, that powerful badge of nationality, dropped its Latin form and became the *volgare italiano*, of which we have traces from the 9th century, and which soon took firmer shape from the literary compositions of the 12th and 13th centuries. Here we may begin to speak of Italian philosophy. But from the conditions of the time this philosophy was essentially European.

The remark has been made by Brunetière and others that lit

erature presents during the Middle Ages a far greater homogeneity than in more recent epochs. The national impress is almost entirely wanting. The same contention could be made with respect to philosophy. The aim, the faith, the language, and the mental habits were almost everywhere the same; we can no more talk of an Italian philosophy than of a French or a German.

The origins of this European philosophy are fairly well known. Faith weakened and doubts grew rife; whilst the ancient disputes waxed more prominent. The necessity arose of demonstrating, explaining, and unifying the dogmas with the aid of reason: hence scholasticism. The Church, which was mostly concerned with this work of justification, had its seat in Italy, and loved to recruit its dignitaries from the Italian people; and it was therefore not strange to see many men of Italian nationality in the ranks of the pioneers.

If scholasticism took its origin in Ireland with Scotus Erigena (9th century), it took shape with Lanfranc of Pavia (1005-1089), St. Anselm (1033-1078), Peter Lombard (died in 1160), and reached its apogee with St. Thomas Aquinas (1227-1274),—all of whom were Italians. I shall not give a synopsis of their ideas, for they are well known from the general histories of philosophy, and besides they belong rather to the history of religion. I shall restrict myself to signalling certain general characteristics which we meet within the Italian civilisation of the Middle Ages.

As we have seen, scholasticism is an international philosophy to which Italians have contributed much. But these rich contributions should not lead us astray regarding the true character of Italian demopsychology, for there are certain facts that show that pure speculation was not one of the habits and tastes of the inhabitants of the peninsula. These facts are:

1. The emigration of Italian philosophers;
2. The absence of an Italian scholastic center;
3. Mysticism, opposed to science and philosophy;
4. The skeptical and Epicurean tendency of the cultivated classes;
5. The attempt to give literary (artistic) form to philosophical thought.

Whilst abroad the universities of Paris and Cologne were thronged with professors of philosophy, theology, and logic, the Italian universities possessed only a few chairs of theology; and during the entire 13th century Bologna could show but eight philosophers and Padua five. The greatest lights of scholasticism,—St. Thomas Aquinas, Peter Lombard, and St. Bonaventura,—were compelled to study and to teach beyond the Alps.

The Umbrian mystical movement from about the 12th to the 13th centuries, which spread to the north and the south and which had its apostle in St. Francis of Assisi (1181–1226), its philosopher in St. Bonaventura (1221–1274), and its poet in Fra Jacopo da Todi (1230–1306), is outspokenly hostile to science and dialectics. The simple faith and sentimental contemplation of this mysticism are a distinct reaction against the logical spirit of scholasticism.

In the higher classes another current is noticeable,—the sceptical heterodox current which is represented by the poets. Here may be classed the Emperor Frederick II. (1194–1250); his son Manfred (1232–1266); his minister Pietro delle Vigne (died 1249); the Florentine poet Guido Cavalcante (1251?–1300), the physician Pietro d'Abano (1250–1316);—who sought to disentangle the philosophy of nature from religious dogmas, and like Roger Bacon was accused of practicing magic. The two first named had the works of the Arabs and of Aristotle translated, and antagonised the Church. Guido Cavalcante discussed the question of the existence of God; Pietro d'Abano translated the works of Ibn Ezra; a wandering clergy revived the cult of nature, of love, and of life; and even a cardinal, Ottaviano Degli Ubaldini (died 1273), went so far as to doubt the existence of the soul.

The pious contemporaries did not look with favor upon these skeptical and Epicurean thinkers, and Dante consigned some of these thinkers to the sombre depths of his *Inferno*. But this scepticism exists rather in the air than in the form of a definite system; thinking people wish to be free, to live at their ease, and have less of religion and religious institutions; but no one ever seriously thought of establishing a doctrine. They sought to criticise the

Church, which had grown too rigorous and exacting; but they were careful not to indulge in metaphysical speculations.

But the Italians are not only mystical and skeptical; they began also to be artistic and æsthetic. Italian poetry is created (13th century), and soon ceased to imitate the lyric poetry of the Provence. At Bologna and at Florence arose what is called the school of the *dolce stil nuovo* (the sweet new style), to which belonged Guido Guinizzelli (died 1276), Guido Cavalcante (1251?-1300), and Dante Alighieri (1265-1321). One of the distinguished characteristics of this school was to give poetic form to philosophical ideas. Dante went farther than his associates, and in his *Divina Comedia* he created a poetical encyclopædia of the historical and moral world of the Middle Ages, with the philosophy of St. Thomas Aquinas playing the chief rôle. The Italian genius which aspired for beauty sought to give æsthetic form even to the syllogisms of scholasticism.

But with Dante, who celebrated the last triumph of the Middle Ages, we approach the Renaissance. After him two men equally famous, Francesco Petrarch (1304-1374) and Giovanni Boccaccio (1313-1375), the first of whom is a mystical antagonist of Aristotle and the second an Epicurean little concerned with ideas, unearthed a new world which was to shatter the idols of the Middle Ages and give birth to the new thought.

II.

THE RENAISSANCE (XV.-XVII. CENTURIES).¹

The Renaissance is the age of movement and of life, and therefore is necessarily the age of confusion. The age of awakening and resurrection is always the age of reminiscence and of discovery: unity and coherence are wanting to it. This condition of things is reflected in philosophy. The thinkers rebelled against the ancient

¹ For the Italian philosophy of the Renaissance see the following works: Manriani, *Rinascimento dell' antica filos. italiana*; Spaventa, Fiorentino, *Il risorgimento filosofico del 1400*, Naples, 1885; and the studies of D. Berti, L. Ferri, and F. Tocco on Bruno, Campanella, Pomponazzo, Cremonini, Galileo, etc. See also J. Owen, *The Skeptics of the Italian Renaissance*, London, 1893.

ideas, but they retained the old habits and forms of thought: they sought to find the new, and reverted to the old. There were out-reachings toward new horizons, but there were also backslidings to the old, and many inherent oppositions to be overcome. The philosophical works of this period reflect the groping agitations of amorphous conditions of mind, and no precise classification is possible. Survivals are distinguishable in the chaos (Thomists and Mystics); revivals (Platonism and Epicureanism); revolts (against scholasticism and Aristotle); and new tendencies (experimentalism). In the better known Italian philosophers like Bruno and Campanella there is a little of all of these: the *débris* of the Middle Ages, classical lumber, and foreshadowings of the future.

The philosophical production of Italy in this period is very great, and Italians are prone to regard the Renaissance as the Golden Age of Italian thought. The reasons for this fact are manifold: greater intellectual activity in all branches of knowledge, extensive knowledge of the classical civilisation, which was impregnated with philosophy, and an intellectual liberty which prevailed after the downfall of the Middle Ages and prior to the Reformation. But quantity is not always a criterion of quality, and discrimination must be exercised. For example, to start with, I would not include in the category of philosophy the numerous moral treatises, like those of Poggio or of Platina, which are nothing but colorless reproductions in elegant Latin of the works of antiquity; and I likewise discard the long philosophical poems, which say nothing worth recording and which are tiresome intellectual feats, and not works of genuine mental effort. And I also intentionally neglect the antiquated scholastic writers who from the retreats of their silent cloisters and the chairs of the old universities have continued even to our day to unwind their subtle syllogisms. I am also compelled to omit the political thinkers who were produced in abundance during the Renaissance and who count among them a Machiavelli (1469-1527), but who lie without the province of philosophical speculations. We are concerned solely with the thinkers who have really influenced the thought of Italy and of the world by their criticism of the narrow conceptions of peripatetic scholas-

ticism and their contributions to the creation of a philosophical method.

One of the important forms of opposition to Aristotle was the Florentine Neo-Platonism. The rôle of the Byzantine Greeks in the Renaissance has been exaggerated, but in the introduction of Plato into Italy their influence was real. It is true, Petrarch had already opposed Plato to Aristotle, and he possessed many Platonic dialogues translated into Latin; but the creation of a Platonic school was the work of a Greek, Georgius Gemistus Plethon (1355-1450); and it is certain that the famous controversy of the Greeks (1439-1471) regarding the superiority of Plato or Aristotle contributed to disseminate in Italy a taste for the great idealist. The founder of the Platonic Academy in Florence, Georgius Gemistus, is the restorer in the West of the Alexandrian eclecticism, partly Oriental and partly Grecian, learned without criticism and mystical without dogmas. His disciple and successor, Marsilio Ficino (1433-1499), who was the true master of the school, mingled the ideas of Zoroaster, Plato, and Plotinus; but Plato remained the deity of the school, and it is said that Marsilio kept a lamp perpetually burning before the image of the great philosopher. The Florentine group was quite numerous, and counted among its members several celebrities, like the famous humanist and poet Angelo Poliziano (1454-1494), Giovanni Pico della Mirandola (1463-1494), an encyclopædic scholar and a devotee of occultism; Cardinal Giacomo Sadoletto (1477-1547), an unrivalled Latinist; and lastly, the two protectors of the Academy, Cosimo and Lorenzo de Medici.¹ Later the Academy dissolved, but Platonism remained with the philosophers, especially with the men of letters. It would appear that Tuscany was a favorable center for the idealistic philosophy, for as late as the 17th century Cardinal Leopoldo de' Medici founded a new Platonic Academy and a second group of Florentine Platonists flourished, of whom the best-known is Orazio Rucellai (1604-1674).²

¹ Regarding the Platonic Academy, see A. Della Torre, *Storia dell'Accademia Platonica di Firenze*, Florence, 1902.

² See A. Alfani, *Della vita e degli scritti di Orazio Rucellai*, Florence, 1872.

Another philosophical renaissance, to which a well-known modern Italian philosopher, G. Trezza, has attributed great importance, is Epicureanism. For him the real significance of the Renaissance was the return to Epicurus as the philosopher of the scientific conception of the world and the Hedonistic conception of life, following upon the oppressive "discontinuity" of the Middle Ages. This is the truth, but not all of the truth. The Epicureanism of the Italian Renaissance is real, but it was rather in the life than in the thought of the nation, which preferred to be Epicurean in practice to writing theoretical works on Epicurean science. One of the most famous representatives of Epicureanism is Lorenzo Valla (1405-1457), author of the work *De voluptate*, and M. Gabotto, who has studied the subject and finds traces of its influence in Marsilio Ficino.

The revival of the ancient systems naturally resulted in criticisms of the philosophy of the age just passed, and the adversaries of scholasticism were many. We find them among the Platonists (Poliziano and Sadoletto) as well as among the Epicureans (Valla). Even Aristotelians are found in their ranks. Ermolao Barbaro (1454-1494), the translator of Aristotle, called Albertus and St. Thomas "*barbari philosophi*."¹ The blows directed against scholasticism thus also struck the Aristotelian doctrine, which in part was at the basis of it. But Aristotle remained nevertheless the philosophical master of the Renaissance.

The Aristotelians of all ranks constituted a real army, and they continued to flourish until the 18th century. There are the old Aristotelians who followed the Arabian commentators (Averroes), such as Nicoletto Della Vernia (died 1499), A. Achillini (1463-1512), A. Nifo (1473-1546), Zimara (died 1532), Cesalpino (1519-1603).² There are those who followed the commentator Alexander of Aphrodisias, such as Pomponazzi (1462-1525), S. Porzio (died

¹ Other anti-scholastics are: Leonardo Aretino, Filelfo, Nizolio, Aconzio.

² For information on the school of Padua, which was the stronghold of Averroism, see E. Renan, *Averroes et l'Averroïsme*, 2nd edition, Paris, M. Levy, 1861, pages 322-434; Mabillean, *Étude hist. sur la phil. de la Renais. en Italie*, C. Cremonini, Paris, 1881.

1555), Scaligero (1484-1559), Zabarella (1532-1589), Cremonini (1552-1631); while there are others that adhered closely to the Greek texts, now finally made known, as Ermolao Barbaro (1454-1493), Leonico Tomeo (1456-1531), etc. Some of these restrict themselves to expositions and commentaries and have added nothing new to philosophy; some of them continued to develop the Peripatetic doctrine, while others criticised it or differed from it in certain points.

But the number of those who rejected Aristotle altogether is very small, and even Galileo, who is held up to us as the symbol of Italian anti-Aristotelianism, professed genuine esteem and admiration for the master of Stagira. The best-known names of Italy are found among the Aristotelians: Pomponazzi, Nifo, Contarini, Leonico Tomeo, Vanini, Cremonini, Piccolomini, Achillini, Cesalpino, Zabarella, etc.

Some of these are very important. Pomponazzi (1462-1525), for example, had bold ideas, and derived from Aristotle's philosophy doctrines which spoke unmistakably of the new times. He affirmed the immortality of the soul, the relativity of knowledge, the naturalness of phenomena; he rejected miracles, denied free will, and stood for experience and universal determinism. But he derived many dangerous things from Aristotle, and, despite his reticence in Church matters, his book *De immortalitate animæ* (1534)¹ was publicly burned.

P. Icilio Vanini (1585-1619) was perhaps a disciple of Pomponazzi and advanced still bolder ideas. He departed widely from Aristotle, professed an irreligious, cosmological materialism which he cloaked with irony, and had flashes of genius, as is proved by his ideas on animal evolution and on the influence of environment on the characters of men. This time they were not content to burn the books of the philosopher, but burned the unfortunate man himself, at Toulouse.²

¹ See L. Ferri, *Pomponazzi e la Rinascenza*, Florence, 1872.

² V. Cousin, *Fragments philosophiques*, Mod. I., pp. 1-99; R. Palumbo G. C. Vanini e i suoi tempi, Naples, 1878; N. di Cagno-Politi, *G. C. Vanini*, Rome, 1894.

But it would take too long to examine everything that the disciples of Aristotle have added to the doctrines of the master, and we shall pass on to those who have had greater aspirations of originality. But these aspirations were not always satisfied, and I shall cite for example Francesco Patrizi (1527-1597), who in his work *Nova de universis philosophia* (1591) claimed to have created a new philosophy, which was in effect only a confused congeries, formed of Platonic theories, of ideas attributed to Hermes and Orpheus, and of garbled doctrines of Zoroaster, Parmenides, and Telesio.

Two philosophers only of this period reached anything like originality and produced ideas which entered into the composition of European thought: they were Giordano Bruno and Tommaso Campanella.

It is not an easy task to speak of Bruno (1548-1600) after the numerous studies which have been devoted to him in all countries.¹ He is without doubt the best known, most widely discussed, and most variously interpreted philosopher of Italy. To Bartholmess, he is a pantheist and a precursor of Spinoza and Hegel; to Clemens and Carrière, he is an atheist; to Brunnhofer and Morselli, he is a monist and a Darwinian. But after the learned and profound analysis which M. Tocco has made of his Latin works, I accept this writer's theory of the three phases of Bruno's thought.²

Bruno was first a simple Neo-Platonist; afterwards he leaned toward Parmenides and Heraclitus, and the third and last stage of his evolution carried him as far as Democritus, the atoms of whom he conceived as endowed with a common and single spiritual energy (*monadi*), thus anticipating in many respects the monadology of Leibnitz. But at bottom his philosophy is essentially monistic and

¹ See the studies of Berti, Bovio, Brambilla, Ferrari, Di Giovanni, Levi, Mariano, Martinis, Maturi, Morselli, Pellizzari, Pognisi, Previti, Schiattarella, Stia-velli, Tocco, Graziano, Troilo, Fiorentino, Spaventa, etc. (for Italy); Saisset, Cousin, Debs, Vacherot, Bouillier, Desdouits, Marc Monnier, etc. (for France); Bender, Beyersdorff, Kuhlenbeck, Ritter, Landseck, Riehl, Thikötter, etc. (for Germany); Frith, Owen, Davidson, etc. (for England and America). The best biography is that of Berti, Turin, 1868, 1889.

² G. Tocco, *Le opere latine di G. Bruno*, Florence, 1889; id. *Le opere in edite di G. Bruno*, Naples, 1891.

naturalistic; in physics he boldly combats the natural philosophy of Aristotle, and surmises the homogeneity of the terrestrial and celestial bodies. In psychology he had a very clear idea of the laws of association; in cosmology he was the first to base his hypotheses on the new heliocentric theories; in philosophy, finally, he was the first to proclaim "philosophical liberty," of which he was the expression and for which he perished in the flames. His works abound in contradictions, incertitudes, and even in naïve and ridiculous ideas; but he possessed a truly grandiose vision of the universe and he had with respect to its structure intuitions which modern science has only corroborated and rendered more precise. His philosophy is dominated by the idea of the infinite; the infinite is space, the infinite is the universe, which he identifies with God, who is its soul. For the prime mover of Aristotle, for the creator of the scholastics, he substituted the Eternal, natural causality, the *natura naturans*, which is always becoming and which finds its explanation in the *natura naturata* and remains always one and the same. Nothing is born, nothing perishes; whatever is, is transferred and reproduced. "Synthesis of monism and of atomism, of idealism and of materialism, of speculation and of observation, it is the common stock from which modern ontological doctrines have emanated" (Weber). If we add that it has influenced Bacon, Spinoza, Malebranche, Leibnitz, Diderot, Jacobi, Schelling, and Hegel, it will be admitted that its importance has in no wise been exaggerated, and I regret that space prevents me from saying more about him.

Although less known, Tommaso Campanella (1568-1639) is not less important. He is not only a metaphysician; he is also an epistemologist. Just as he had projects for political and social regeneration, so likewise he aspired to reform knowledge (*Disputatio in prologum instauratarum scientiarum*) and philosophy (*Philosophiae universalis*,¹ 1638). He is hostile to the ancient metaphys-

¹ For the biography of Campanella see the works of M. Amabile (1882, 1890, and 1895). For his philosophical theories, see the studies of D'Ancona, Spaventa, Ferrari, Berti, Fiorentino, Sanesi; and G. Sante Felici, *Le dottrine filosofico-religiose di T. Campanella*, Lanciano, 1895.

ics, and esteems highly the experimental movement, though seeking in all essential respects to preserve the theological edifice of Christianity. This leads him to reject the pure naturalism of Bruno, to accept a species of Neo-Platonic transcendentalism, and to indulge in dreams concerning the political supremacy of the Roman Church. His greatest originality is shown in his theory of knowledge, which is developed at length in his *De optimo genere philosophandi*. He expounds the doubts advanced by the sceptics, and even appears himself to be slightly inclined in this direction, at least so far as the doctrines of others are concerned; for he writes: "Follow no sect of philosophers, and do not imagine that they are free from error, for everybody is a liar or some way in error through either ignorance, wickedness, or fear. God alone is the truth" (Art. 11). At bottom he is openly a sensationalist: *Sentire est sapere*. He is perfectly clear on this point, although he gives the word *sentire* a broader meaning than do the pure sensationalists of the 18th century. But his sensationalism does not culminate in idealism or in scepticism, for he appeals to the internal sense, viz., reason, to effect the passage from sensation to the outward world, maintaining that we can reach the notion of the non-ego directly. But God alone really knows the non-ego, the absolute; our limited reason must content itself with relative knowledge.

If space did not fail me, I could show the extent to which Campanella's theories have influenced Descartes. The idea which he thoroughly grasped and which he often repeated is that we must scrutinise nature face to face, observe facts, and cast aside books and the opinions of men. He lauded experience, encouraged Telesio and Galileo, whilst at the same time, with an inconsistency which I noted above, he believed in magic and astrology.

In his metaphysics we may observe the importance which he assigned to impulsions and to will (*velle, amor essendi*); and Weber has asserted that "No one previously to Leibnitz conceived with greater clearness the fundamental idea of a concrete spiritualism." He was, as we know, imprisoned and persecuted despite his Catholicism; and after him, until the 19th century, Italy produced no metaphysician of his caliber. Italian thought repeats the echoes

of foreign lands and takes refuge in the observation of facts. But before it began to slumber it gave to the world that scientific method of which we have found the first exponents as early as the 15th century.

III.

THE FORMATION OF METHOD.¹

Leonardo da Vinci (1452-1519) is perhaps the greatest intellect that Italy ever produced. He is certainly the grandest figure of the Renaissance. He possessed great productive power and breadth of view; he was at once painter, sculptor, engineer, scholar, philosopher, and writer; he was in advance of his times, for Leonardo's rank as a thinker was not discovered until the 19th century. If as a philosopher he did not exert much influence on his contemporaries, he nevertheless possessed on questions of science and method ideas as clear and modern as those of any scientist of our day. Experience, which appears to be the discovery of the 17th century, was even then his guide. "Shun," he says, "the doctrines of thinkers whose reasons have not been confirmed by experience." He observed and investigated incessantly; his notebooks are filled with the notes and sketches of all manner of things, and he gives very original instructions concerning methods of inquiry; he is rigorously deterministic, and a pronounced foe of miracles, occult sciences, and essences.

I cannot speak of Leonardo's discoveries in physics, geology, botany, physiology, and anatomy, and I shall limit myself to mentioning that we owe to him the law of inertia, the principle of least effort, and the first ideas on comparative anatomy. His gnoseology, which we find scattered throughout his manuscripts and which an Italian scholar, M. Solmi, has well reconstructed, is important, and we find in it ideas which pass as quite modern. He respects the ancients, but rejects the principle of authority and was a declared enemy of scholasticism. Although his preference was always for induction, he asserted before Descartes that mathematics was

¹ For the history of the experimental method see R. Caverni, *Storia del metodo sperimentale*, Florence, 1891-1895.

the most perfect form of human knowledge, and he declares that we can call only those branches of knowledge sciences which we can reduce to mathematical form. His psychology is quite profound and represents an advance over his predecessors: he was the first to observe reflex movements. If he is almost a positivist, he is not a materialist; and while he insists on the psychophysical relations, he connects mechanical necessity with moral necessity. The life of man, he says, helps us to comprehend universal life. Our body is created by our soul, and it is the same with the world as with man; it is the spirit which moves it and organises it. His cosmology, which recalls slightly that of Anaxagoras, is less original, but his ethics contains principles, preponderantly individual in character, which have not always been understood, even to-day.¹

In the 15th century, Leonardo stood almost alone, but in the 16th he had his successors, of whom I shall mention the following: Aconzio (1492-1567), known principally as a theologian, but also the author of a book, *De methodo* (1558), in which he anticipates Descartes in his theory of innate ideas and geometrical analysis; Giambattista della Porta (1530-1615), scientist and observer, who founded the Academy of the *Secreti* and to whom the invention of the telescope and the camera obscura is attributed; Pietro Sarpi (Fra Paolo of Venice, 1552-1625), famous for his political vicissitudes and as the author of a very important treatise on logic, with sensationalist tendencies, and containing theories which read as if borrowed from Locke; Bernardino Telesio (Cosenza, 1509-1588), who was in the south of Italy the representative of new naturalistic and empirical tendencies. The latter abandoned Plato and Aristotle and sought to create a speculative doctrine with the aid of observation and experience alone. He rejected abstractions and

¹ Regarding Leonardo as a philosopher, see in addition to the general biographies (Müntz, Séailles, etc.) the following works: H. Grothe, *Leonardo da Vinci als Ingenieur und Philosoph*, Berlin, 1874; L. Ferri, "Leonardo da Vinci, scienziato e filosofo," in *Nuova Antologia*, 1873; Fritz Raab, *Leonardo da Vinci als Naturforscher*, Berlin, 1880; Prantl, *Leonardo da Vinci in philosophischer Beziehung*, Munich, 1885; W. R. Thayer, "Leonardo da Vinci, a Pioneer in Science," *The Monist*, July, 1894, pp. 507-533; E. Solmi, *Studi sulla filosofia naturale di Leonardo da Vinci*, Modena, 1898.

sought for real things (*realia entia non abstracta*), declaring that he preferred induction and experience to all the distinctions of scholasticism.¹ He succeeded in surrounding himself with a group of disciples among whom are to be mentioned Quattromani, Cavalcante, Gaeta, Donio, Persio, Montano, and Bombino. One of his pupils, Aulo Giano Parrasio (1470-1534), even founded an academy which was afterwards called the Telesian; but despite the boldness of his theories and the great labors of his school, it does not seem as if the results were very productive for science. The contrary was the case with the experimental school of Tuscany, the renowned founder of which preferred investigations to theories.

The name of Galileo Galilei (1564-1642) is too well known to require comment. His discoveries in physics and astronomy have made him familiar to the whole world.² He is less known as a philosopher, and as a matter of fact never wrote a purely speculative work. Yet his reflections on method and science, although scattered through his scientific writings and his letters, could be easily collected and would form a methodological work far more solid than the *Novum organum*. According to the studies of Tönnies, Natorp, Löwenheim, and Grimaldi we must also see in Galileo a philosopher of nature. It is true, he has assumed no defined attitude toward metaphysical hypotheses, but he possessed a real cosmology, a mechanical and atomistic conception of the world, which resembled that of Democritus.

Galileo's influence in Italy and abroad has been very great, and it will be sufficient merely to recall to mind the great debt which Descartes and Hobbes owe to him. If we compare him with Francis Bacon, we see plainly that he was far greater in intellectual stature. Not only did he precede Bacon in clearly stating the worthlessness of the old method and in formulating the rules of the new, but there is absolutely no trace in his works of the ridiculous

¹ Regarding Telesio, see L. Ferri, *La filosofia della natura e le dottrine di Bernardino Telesio*, Turin, 1873; F. Fiorentino, *Bernardino Telesio*, Florence, 1872.

² The bibliography of Galileo is very rich (A. Carli and A. Favaro, *Bibliografia Galileiana*, Rome, 1896). The most important studies are those of M. A. Favaro.

intellectual survivals and grotesque ideas found in those of the English chancellor. He did not *dream* of a machine for making inventions; he made them.

We see thus that the leading ideas of the English empiricism of the 17th century are of Italian origin and were formed during the 15th and 16th centuries. As the significance of Kant was lessened after a better study of Locke and Hume, so the glory of Bacon will be lessened after a profound study of our philosophy of the Renaissance.

IV.

THE SPECULATIVE SLUMBER.

Italy was already beginning to show marks of exhaustion toward the end of the 16th century. The peninsula was divided and subject to absolute foreign governments, the counter-reformation had already begun its work, and the Renaissance, which had originated with the 14th century, had now flourished for 300 years; it will hence be intelligible why the 17th and a part of the 18th centuries were a period of decadence. It demanded great effort to be for 300 years the focus of European civilisation; the nation as well as the individual needed rest.

But the 17th century was not entirely one of decadence. Science continued its profitable labors, and art still produced meritorious works, now much decried but in their day still the envy of Europe. I refer to Marini and Bernini. Italy was not dead; she merely slept.

The succession of scholars which formed the school of Galileo, to which belonged the famous names of Torricelli, Viviani, Castelli, Redi, Magalotti, Marchetti, Bellini, and others, enriched the sciences of observation with precious discoveries and literature with models of clear and elegant prose; but there was not one philosopher among them. Thus more and more did the development of the national intellect depart from the domain of pure thought. Italy, writes M. Barzellotti, had no distinct speculative movement during the 17th and 18th centuries.

— At this date the invasion of foreign, and particularly French,

ideas begins. Descartes, Malebranche, Leibnitz, Wolff, Gassendi, and Locke were introduced into Italy in turn and represented modern thought among the Aristotelians, Platonists, and Thomists, who repeated and commented on the past. The ideas of Descartes, and shortly afterwards those of Malebranche, found among us many admirers.¹ Gregorio Caloprese, Tommaso Cornelio (1614-1684), Michelangelo Fardella (1650-1718), Tommaso Campailla (1668-1740), Alfonso Borelli, Valentino Alberti, although they sometimes make pretensions to originality only repeat with slight alterations and minor differences what the masters of France said before them.² The most remarkable among them was without doubt the Sicilian Michelangelo Fardella (1650-1718), who in 1691 published his *Universæ philosophiæ systema* (Venice). Fardella lived in France and there became acquainted with Malebranche and Arnauld. In method he is a genuine Cartesian, and he accepts innate ideas, combating the sensationalist dogma of *Nihil in intellectu, etc.* He thus closely resembles Malebranche, and, in his zealously maintaining that the existence of bodies cannot be shown in any manner, he sometimes appears to anticipate the English idealists Collier and Berkeley.

But the Cartesian philosophy also found its adversaries in Italy and controversies were common concerning particular questions, like that of the soul of beasts, etc. Among the adversaries of Descartes, such as Agnani, Pino, Ceva, we find one celebrated name, Giovanni Battista Vico (1668-1744),³ whom we must pause for a moment to consider.

Vico is best known as a writer on the philosophy of history, but he has also touched in his works on almost every problem of

¹ On the Cartesian philosophy of Italy see Bouillier, *Histoire de la philosophie cartésienne*, Paris, 1854, Tome II., Chapter XXII.; K. Werner, *Descartesisch-Malebranchische Philosophie in Italien*, Vienna, 1883.

² One of the latest Cartesians of Italy was Sigismondo Gerdil (1740-1802), who defended Malebranche against Locke.

³ See the studies of Ferrari, Sarchi, Michelet, Cattaneo, Labanca, Rossi, Croce, Cosentini, Giordano; also K. Werner, *Giovanni Battista Vico als Philosoph und gelehrter Forscher*, Vienna, 1879. See Cantoni, *Giovanni Battista Vico*, Turin, 1867; R. Flint, *Giovanni Battista Vico*, London, 1884 (Italian translation Florence, 1888).

philosophy. He was inspired chiefly by Plato and Bacon, and he was a foe of the scepticism and the Cartesian rationalism of his day. Nevertheless, his method has geometrical tendencies, and his *degnita* (axioms) sometimes remind us of the definitions of Spinoza. His greatest originality consists in his having introduced collectivities into the world of thought. His *Principi di una scienza nuova* (principles of a new science) is quite original, although the origins of his conceptions are sometimes traceable to Plato and St. Augustine, or still later to Machiavelli, Campanella, Bodin, and Grotius.

Vico's historical system is substantially as follows: Men issued from their primitive bestial state under the goads of necessity and utility, which induced them to form societies. The development took place in three stages: first, the divine age in which society is patriarchal, with an absolute master and the weak overpowering the feeble; secondly, the heroic age with its aristocratic monarchy, where the nobility and the people are arrayed against one another; thirdly, the human age, which established equality and the reign of law. Every people passes through these three periods, and in the end is either destroyed or reverts to its primitive state. Thus, history is a universal rotation formed of *corsi e ricorsi*. But the importance of the thought of Vico lies not only in this general view of humanity, which, like all historical systems, is artificial. In his works are also to be found valuable scattered observations on individual and social psychology, on law, sociology, and method. It may be said that he constructed a real philosophy of the mind and in a certain sense he anticipated Kant (Spaventa). He was the first, long prior to the Germans, to raise the Homeric question, which denied the personality of Homer; he maintained and demonstrated the parallels existing between children and primitive men, and lately M. B. Croce, a well-known philosopher and historian, has shown that we may regard him as the real creator of the science of æsthetics.¹ But his work long remained unnoticed, for he did not belong to his time and his greatness was not discovered

¹ B. Croce, *Estetica: Teoria e storia*, Palermo, 1902, pp. 228-243.

until the last century, in Italy, France, and Germany.¹ He is a continuation in some measure of the line of the Renaissance, but he has qualities which are distinctively modern, and we may characterise him as the last of the old thinkers and the first of the new.

V.

THE ITALIAN "AUFKLÄRUNG."

Italy also had its encyclopædists and its illuminati. They were inspired mainly by French thinkers, as these latter had in part been inspired by the English, and they consequently exhibit similar characteristics. As with their *confrères* across the Alps, the dominating philosophy was a sensationalism which went back to Locke, and sometimes leaned toward materialism. They were deists, proclaimed the rights of reason and natural morality, had cosmopolitan tendencies, were hostile to the clergy and the Middle Ages, and busied themselves with practical questions like law and sociology, rather than with speculative questions. They were a little narrow, a little dogmatic, a little commonplace; but that was the reason of their relative success, for the majority were certainly not born to entertain lofty ideas.

The Italian illuminati differ from the French, with whom they must be compared, by their greater critical moderation and more sincere respect for religion. The Italians, who love traditions, could never be absolute destroyers, and it would be almost impossible to conceive an Italian Voltaire.

The centers of the Italian *Aufklärung* were the cities of Milan and Naples. The northern group counted among them Francesco Algarotti (1716-1762), an Italian citizen of the world and populariser of Newton; Saverio Bettinelli (1718-1808), a Jesuit of an advanced type, celebrated for his criticisms of Dante; Gian Rinaldo Carli (1720-1795), scholar and polygraph, who aided in abolishing the Inquisition in Lombardy; Cesare Baldinotti (second half of the 18th century), disciple of Gassendi, Locke, and Condillac, who

¹In connection with Vico we can mention Jacopo Stellini (1699-1770), who occupied himself a great deal with social philosophy (see Ardy, Luzzatto, Cicchitti-Suriani). Filangeri, Pagano, and Ferrari also show the influence of Vico.

sought to reconcile empiricism with dogmas; Paolo Frisi (1728-1784), traveller, mathematician, apostle of new ideas, who combated magic and the Jesuits; Alberto Fortis (1741-1803), progressive abbé and wit who died in France; Aurelio De'Giorgi Bertola (1753-1798), who was among the first to study German literature, and who published the first treatise entitled *The Philosophy of History* (1787). Of Della Torre Rezzonico, Caserotti, and the rest, we need not speak. The most famous of all this group were, however, three Milanese, the two brothers Pietro and Alessandro Verri and Cesare Beccaria, the founders of the *Caffè* which for two years (1764-1766) was the organ of the Italian encyclopædists.

Pietro Verri (1728-1797) was undoubtedly one of the most remarkable men of his time, and he was very active as an administrator and a writer. Although he was mainly occupied with politics, political economy, and history, he is entitled to a place in the history of Italian philosophy, not alone by virtue of his purely general ideas, which he held in common with the others, but by virtue of his psychological and moral doctrines. His two most important productions (*Discourse on the Nature of Pleasure and Pain*, 1773; *Meditations on Happiness*, 1781) contain new and ingenious ideas on the function of pain and the law of contrasts, which were afterward adopted by Kant, Schopenhauer, and Wundt and discussed by Dumont, Bouillier, and Regalia.¹

His brother Alexander (1741-1816), although holding similar ideas, was not of the same prominence, and he also ranks below his friend Cesare Beccaria (1728-1794), whose work on *Crimes and Punishments* has made him famous throughout the whole world, but who is not, strictly speaking, important as a philosopher.²

The Neapolitan group was less numerous, but not less influential. We may count among them Pietro Giannone (1676-1748), a philosophical historian much persecuted by the Church; Ferdinando Galiani (1728-1787), political economist and wit, known mainly from his sojourn in France, and called by Marmonel a harle-

¹ Bouvy, *Le comte Pietro Verri et son temps*, Paris, 1893.

² See the essays of Villari and Paoli.

quin with the head of a Machiavelli; Mario Pagano (1748-1799), the successor of Vico and Beccaria, philosophical historian, esthetician and criminologist, and one of the martyrs of the Neapolitan revolution;¹ Gaetano Filangeri (1752-1788), author of a work called *The Science of Legislation*, original but inspired by Montesquieu; Niccola Spedalieri (1740-1795), who in his *Rights of Man* (1791) sought to reconcile Christianity with the new ideas of emancipation.²

As we see, these men are mostly sociologists occupied with the practical questions of ameliorating the conditions of justice and education, or combating prejudices. It is only seldom that they touch on purely philosophical questions. The only one that was outspokenly philosophical was Antonio Genovesi (1712-1769), who has left us numerous writings of metaphysics, logic, and ethics. He is at bottom an eclectic following in the main Locke and Leibnitz.³ He infused a slight tincture of doubt into the dogmatic environment of his day, and denied the possibility of knowing substance, affirming that bodies are phenomena only. But he was a foe to metaphysical subtleties, which he said should be left to the monks. His greatest fame is perhaps associated with his work on political economy, of which he occupied the first chair ever established in Europe.⁴

The Italian encyclopædists did not end with the 18th century. They inspired two succeeding generations, the second of which came down almost to our own day, and joined hands with the first exponents of positivism. France also had its idealogues, inspired by Condillac, and its revolutionary humanitarians, who at last became absorbed in positivism and socialism, and until the end of

¹ See G. Ottone, *M. Pagano e la tradizione vichiana in Italia*, Milan, 1897.

² See G. Cimbali, *N. Spedalieri*, Citta di Castello, 1880.

³ The doctrines of Leibnitz were followed in Italy by B. Trevisani, T. Cattaneo, and others. The most celebrated representative of Leibnitz's philosophy in a modified form was the Sicilian Vincenzo Miceli (1733-1781). For information on this philosopher and on philosophy in Sicily generally, see V. Di Giovanni *Storia della filos. in Sicilia*, Palermo, 1873.

⁴ See on Genovesi: R. Bobba, *Commemorazione di A. Genovesi*, Benevento, 1867.

the 19th century the intellectual influence of France on Italy was very great.

The second generation of our illuminati was that represented by Gian Domenico Romagnosi (1761-1835)¹ and Melchiorre Gioja (1767-1828). These men are sensationalists and strict followers of Condillac. Towards the year 1758 the Abbé Condillac took up his residence in Parma as the educator of the prince, and dwelt in that city ten years. His influence was great, especially in northern Italy, and his doctrines were translated and taught by Soave, Rezzonico, Barkovic, De Tommaso, Valdastri, Prandi, Corniani, Lomonaco, and others, none of whom produced anything very original. Romagnosi and Gioja used the postulates of sensualism as a means of establishing their social doctrines, which was their main concern. They applied sensationalism to psychology, to political economy, and to the philosophy of history, but their learning did not make amends for their lack of speculative originality. Like their predecessors, they were practical thinkers, having at heart the welfare of mankind.

The first of these two philosophers, in his *Laws of Civilisation* (1834), was the forerunner of the biological theory of society, which has again been developed in our day by Spencer, Schäffle, Lilienfeld, Novicow, and others, and who sustain the doctrines of the naturalness of phenomena, excluding *a priori* every form of the absolute.

Gioja, the founder of scientific statistics and a moralist of great popularity, was the author of original ideas on the necessity of the state, maintaining that the actions of individuals, if uncontrolled, would result in a useless and extravagant expenditure of energy, whereas the work of a directive governmental activity obtains greater results with less effort.

The third generation of Italian ideologists, contemporary with the movement for national unity (1850-1870), is closely connected with Romagnosi, for two of his disciples were its most distinguished representatives. Carlo Cattaneo and Giuseppe Ferrari are republi-

¹ G. Ferrari, *La Mente di G. D. Romagnosi*, Milan, 1835.

can patriots who mingled in the political events of their time while still preserving their master's taste for the social sciences and for popular humanitarianism.

Carlo Cattaneo (1802-1869), a publicist though not a philosopher strictly speaking, exerted considerable influence on Italian thought by his review *Il Politecnico* (1837-1848, 1860 and seq.), around which he gathered the most advanced minds of his country and put Italy into close communication with the thought of foreign countries.¹ Giuseppe Ferrari (1811-1876), whom we shall find among the sceptics, sought in his *Theory of Political Periods* to furnish an exact law for the movements of history. For him the unit of historical time is the life of a generation, approximately thirty years, and to each great historical movement there are four generations: that of the precursors who prepare the way, that of the revolutionists who act, that of the reactionists who oppose, and lastly that of the adjusters and reconcilers, who establish a new equilibrium to be again in its turn disturbed by new precursors.²

With these last-named encyclopædists, heirs of the French Revolution, are connected the first Italian positivists, of whom we shall speak in another article. In order to find again real philosophical speculation, we must retrace our steps to the beginning of the 19th century.

VI.

THE SPECULATIVE AWAKING.³

The Critique of Pure Reason appeared in 1781, but it took nearly half a century for it to reach Italy in the full sense of the word.

¹ A. Mario, *La mente di C. Cattaneo* (in *Rivista Europea*, 1870).

² L. Ferri, *G. Ferrari e le sue dottrine* (*Atti dell'Accad. de' Lincei*, S. M. 1876-77).

³ For information concerning the Italian philosophy of the 19th century, see Marc Debrit, *Histoire des doctrines philosophiques dans l'Italie contemporaine*, Paris, 1859; R. Mariano, *La philosophie contemporaine en Italie*, Paris, 1868; L. Ferri, *Essai sur l'histoire de la philosophie en Italie au XIX^e*, Paris, 1869 (2 vols.); G. Barzellotti, "Philosophy in Italy," *Mind*, 1878 (Italian trans., in *Nuova Antologia*, 1879); A. Espinas, *La philosophie expérimentale en Italie*, Paris, 1880; K. Werner, *Die italienische Philosophie des neunzehnten Jahrhunderts*, Vienna, 1884-1886 (5 vols.). In this chapter I have followed in the main the erudite essay of Barzellotti; Franck, Ferrari, Fiorentino, etc., may also be cited in this connection.

The first Italian translation, by Mantovani, is from 1821-22, and shortly after this the doctrines of Kant were expounded and discussed by Bonfadini, Testa, Ricobelli, as well as made the subject of a course of lectures at Naples by Ottavio Colecchi.

Pasquale Galluppi (1770-1846) also taught at Naples and propounded doctrines similar to the critical philosophy, although at the time he was unacquainted with the works of Kant. For him also the problem of knowledge was the central one of all philosophy, but the only *a priori* which he would admit was that of the moral ideas. The form of knowledge is empirical in origin, and his subjectivism culminates in a psychological realism which recalls Reid and his school, whilst his ethics approaches very closely to that of Kant. He had the great merit of being a real philosopher outside of the narrow confines of religious dogmatism and unaffected by material considerations. He also knew well the history of modern philosophy.¹ He has been considered the first of the line of philosophers who originated in Italy a purely speculative movement which was in certain of its features national, but he was more liberal and modern than any of his successors.² In fact, the philosophers most prominent at this period, viz., Rosmini, Gioberti, and Mamiani, knew the modern systems prior to and succeeding the *Critique*, but they did not fully understand them. The Italians had grown unused to speculation, and they could not suddenly overtake the other nations that had been marching toward the future. Besides, two great events had modified "the intellectual climate" of Italy: the French Revolution and the formation of the kingdom of Italy, which had sown the seeds of liberty and independence from which the great national movement was to spring; and the romantic, idealistic Catholic restoration, which was not favorable to negations and the neglect of dogmas. Thus, the absence of a national and secular speculative tradition, preoccupation with patriotic duties, and anxiety to preserve the fundamental dogmas

¹ A contemporary of Galluppi is another Neapolitan, Vincenzo Di Grazia, whose doctrines also bear a marked resemblance to those of Comte.

² See Lastrucci, *Pasquale Galluppi*, Florence, 1890.

of Catholicism, produced a philosophy which was modern and independent in form but ancient and narrow in contents.

The Abbot Antonio Rosmini (1797-1855), sometimes called the Kant of Italy, propounded in his *Nuovo saggio sull' origine delle idee* (1830), the same problem as did the *Critique*, from which its author accepted the doctrine of the *a priori* character of knowledge. But while Kant posited a plurality of synthetic principles *a priori*, Rosmini sought to show that they could all be reduced to a single one, viz., that of simple possibility and ideality, the idea of indefinite being, innate in the mind, determined through its union with the real, and given by sensation. But he departed considerably from Kant with regard to the origin and the value of the form of knowledge. According to Kant, the categories are the results of the activity of the mind, while according to Rosmini the idea of possible and indefinite being is of divine origin and something similar to the Platonic intuition. For the philosopher of Königsberg the *Critique* is the preparation and the foundation of a new metaphysics; whilst precisely the contrary is the case with Rosmini, who is in almost perfect accord with orthodox theology, yet notwithstanding this fact was unable to escape the censure of the Church. Forty of his propositions were condemned, and his disciples, who were quite numerous in the clergy of northern Italy, have been persecuted even to our day. Despite the profound views discoverable in his works, especially in his *Psychology* and his *Morals*, and even recognising that his system is perhaps the best attempt ever made to reconcile philosophy with the doctrines of the Catholic Church, it must still be admitted that in him the needs of religion stifled the critical thinker and the penetrating analyst.

In his first efforts, Vincenzo Gioberti (1801-1852) departed even more widely than Rosmini from modern thought. For the Rosminian principle of possible being, he substituted the famous formula, *L'Ente crea l'esistente* (the Ens creates the existent). For him, therefore, the fundamental principle of the mind is not the possibility of existence, but the intuition of the same divine reality (*Ens*, Being) which creates the finite realities (existences). Thus, exclaimed M. Barzellotti, was the fiat of Genesis posited as the

foundation of science. And whilst for Rosmini the synthesis of the ideal and the real is the work of the mind, and the second is given by experience, for Gioberti the synthesis is already given in the primitive intuition. Thus, the entire activity of thought resolves itself into translating into reflex language a direct divine revelation, and at bottom, thus, the entire procedure of science is *a priori*. But if Gioberti's philosophy was in complete contradiction with modern thought, it was in complete harmony with the national aspirations of Italy. His *Primato*, in which he maintained the superiority of the Italians in all matters over all other nations, was the Italian book most read about the year 1848 and became one of the factors of our revolution.

After the defeat of the national party (1848-1849), Gioberti, being in exile, changed his political and philosophical views. In his *Protologia* (a posthumous work published in 1857), he distinguishes carefully between philosophy and religion and approaches Hegelianism and Pantheism, which he is desirous of reconciling with Platonism and Christianity. He tended thus subsequently towards rationalism and abandoned his dogmatism, but his later works did not have the same influence as his first.¹

Between Rosmini and Gioberti comes a philosopher who has represented down to our day the philosophy of spiritualism, and who in some respects was the Cousin of Italy, whom he greatly resembled in the influence he exerted. This philosopher is Terenzio Mamiani (1799-1885). After having in his youth taught the philosophy of experience which he discovered in the philosophy of the Italian Renaissance, he finally took up with idealism, occupying a place midway between Rosmini and Gioberti. Poet and man of letters, he was fond also of Plato, and his Platonism appears to good effect in his *Dialoghi di scienza prima*, in which he affirmed the absolute objectivity of ideas. His epistemology aimed to prove that we apprehend finite and infinite reality directly; he admits ideal perception and vision and reconciles Plato and Aristotle by affirming that every universal is *ante rem* and every act of knowledge *post*

¹ The best book on these two philosophers is that of M. G. Gentile, *Rosmini e Gioberti*, Pisa, 1900.

rem. For him the noumenon is accessible to thought, and he thus departs from the position of Rosmini, who denied the imposition of absolute reality. His cosmology is an optimistic monism in which the influence of Leibnitz is clearly revealed; but his philosophy of history is in the main original. The influence of Mamiani on Italian philosophy has been considerable; he founded an academy of Italian philosophy (1850-1855), which did not succeed, however, in amalgamating the philosophical sects, and he created and edited a philosophical review (*Filosofia delle scuole italiane*, 1870-1885), in which to the very last he criticised new theories. He was for a time the head of the official instruction of philosophy of our country.¹

Rosmini, Gioberti, and Mamiani are the three great names of the Italian speculative movement, the golden age of which was in the first half of the 19th century. But around these we may group several other philosophers more or less independent, who have as their common characteristic the desire to uphold Christianity, seeking to reconcile it with reason and philosophy and following the spiritualistic or idealistic tendencies.

Without occupying ourselves with the faithful disciples of Rosmini (Manzoni, Tommaseo, Cavour, Pestalozza, Tarditi, Corte, Peyretti, Paganini, Monti, Bonghi, Garelli, Rayneri, Allievo, Minghetti, etc.), or those of Gioberti (D'Acquisto, Romano, Garzilli, Toscano, Fornari, Acri, Di Giovanni, etc.),—not to mention strict Catholics who imitated the Schoolmen (Ventura, Liberatore, Tapparelli, etc.),—we may be permitted to note the names of G. B. Bertini (1818-1876), who was partly a disciple of Gioberti but concerned himself mainly with the history of philosophy; Domenico Berti (1820-1897), known for his studies on Bruno, Campanella, and Galileo; Augusto Conti (born in 1832), at first a disciple of Gioberti, creator of a system of "perennial philosophy" founded on common sense and revelation, and which was in principle in accord with the dogmas of the Church; and Francesco Bonatelli (born 1830) who defended the Catholic faith in ethics and followed in

¹ See Mestica, *Discorso sulla vita e le opere d'Terenzio Mamiani*, Florence, 1895.

psychology the doctrines of Herbart. But toward the middle of the century a movement arose which was opposed to this national and Catholic philosophy extending from Rosmini to Conti; and we then had two antagonistic schools or rather two antagonistic tendencies. On the one hand were the disciples of Rosmini and Gioberti, who endeavored to harmonise philosophy and religion and who sought to make philosophy Italian; and on the other the disciples of the Germans,—the Kantians, the Hegelians, and the Sceptics.

Towards 1848, there was formed at Naples, where philosophy had been more stimulated and cultivated than in any other part of the peninsula, a group of Hegelian thinkers who were dispersed by the vicissitudes of politics, but who after 1830 formed their school anew in the same city, which had been alternately the nursery and the stronghold of Italian Hegelianism.

The most remarkable representatives of this movement were A. Vera, Bertrando and Silvio Spaventa, Francesco De Sanctis, C. de Meis, R. Mariano, S. Gatti, F. Persico, A. Tari, M. Florenzi Waddington, P. Ceretti, D'Ercole, and others. Two tendencies are distinguishable here: the orthodox, which reproduced faithfully the German master (Vera, Mariano), and the critical, which had more numerous and more important followers.

The most faithful disciple of Hegel was without doubt Augusto Vera (1830–1885), one of the most active disseminators of the theories of absolute idealism in Italy, France, England, and other countries. Incomparably more important for Italian thought was Bertrando Spaventa (1817–1883), who was the critic of the school and who in one of his writings (1850) attacked the Italian school of Rosmini, Gioberti, etc. in the name of absolute idealism. He also sought to renew the national tradition without going back so far as scholasticism, and he contended that the national thought had been checked in the Renaissance with Bruno, the precursor of Spinoza, and with Campanella, the precursor of Descartes. But in his later writings he discovered that Galluppi and Rosmini have been Kantians without knowing it, and it was ultimately reserved for him to

say that Gioberti had been a Spinozist in his first works and a Hegelian in his last.¹

The influence of the Hegelian philosophy was very great on the critical and æsthetical studies of Italy, and Francesco De Sanctis (1870-1883) is considered the greatest critic of modern Italy. In the sciences, Camillo De Meis (1817-1891) in his work *Tipi animali* sought a new solution of the problem of the transformation of species, and attempted to reconcile the results of Darwin with the principles of idealism. Pietro Ceretti (1823-1884), instead of narrowly following his German master, attempted to continue the Hegelian speculation by constructing a new system; but it does not appear that his attempt was a happy one.

The sceptical group of the opposition is not near so large. Speculative scepticism has not deep roots in Italy; it is a product of importation. We find here Giuseppe Ferrari (1811-1876) whom we have already met among the last of the illuminati, but who in his *Filosofia della rivoluzione* (1851) has expounded in a very singular form the phenomenalism of Protagoras as rejuvenated by the empiricism of the 18th century and the critical philosophy of Kant. Starting with the continual becoming, he makes necessary contradiction the law of being and thought, and ends with denying the value of logic and science,—a conclusion which does not prevent him from believing in his own historical arithmetic.

Ausonio Franchi (his real name is Cristoforo Bonavino, 1820-1893) also derived his inspiration from the Encyclopædia and Kant, and in his *Filosofia delle scuole Italiane* (1852) he subjected to a searching criticism the idealism of Rosmini and Gioberti, whom he identified with the scholastics. He wrote many works, of which none was very popular, in which he combated the theism and the dogmas of the Church, vacillating between sensism (based on sentiment or on sensation) and the critical philosophy of Kant; but in the last years of his life he donned the robe of a monk, and in his last work (*Ultima critica*) he reverted to the doctrines which he had at first so bitterly opposed.

¹ See the philosophical writings of B. Spaventa, edited by M. Gentile, Naples, 1900.

We have here reached the threshold of the epoch in which we now live. But I cannot quit this period without at least making mention of two men who have exercised a certain influence on Italian thought, although they do not in the true sense of the word belong to philosophy. I refer to Giacomo Leopardi (1799-1837), who expounded a definitive and hopeless pessimism in his lyrical poems and essays, and was the author of thoughts full of humor and bitterness widely read by our youth; and to Giuseppe Mazzini (1808-1872), a celebrated revolutionist, who was the enthroned apostle of moral, spiritual, and humanitarian deism.

But while the different philosophical movements of which we have spoken were disputing for the mastery (1850-1870), in France and England a new positive philosophy was forming which, allied with evolutionism and monism, was destined to triumph over the whole civilised world. Italy, by its traditions of experimentalism and encyclopædism, was a favorable medium for the reception of these new or rejuvenated ideas. Toward 1870, positivism began to be mentioned with us, and it is at this point that we shall next begin when we endeavor to survey the philosophical movement of new Italy (1870-1902).

GIOVANNI PAPINI.

FLORENCE, 1902.

LITERARY CORRESPONDENCE.

FRANCE.

M. GEORGES LECHALAS offers us a number of *Æsthetical Studies* which without question rank among the very best that have been published on this subject for a long time. It is true, he expounds and discusses rather than offers positive contributions; but I am far from criticising him for having done so. In questions so complicated and delicate as the present, it is befitting first to acquire knowledge, and it is to this task that he applies himself with success.

In the first three studies, which are entitled "The Beautiful and the Ugly," "What is Art?" "Art and Nature," M. Lechalas prepares for the examination of a most important problem, which he exhaustively treats in the three following studies: "Art and Mathematics," "Suggestion in Art," "Alliances and Associations of the Different Arts."

There is at the basis of our organic nature a tendency to rhythm; if it is difficult to discover this rhythm in our movements, it is because our will almost always intervenes as a disturbing element. Very conspicuous in music, there is less rhythm expressed in ordinary speech, but much more of it in oratory, and still more in poetry. M. Lechalas recalls on this subject the experiments of the Abbé Thiéry at Louvain, from which it would follow that the spoken word exhibits all the essential characters of music and notably the relation of all the notes to the tonic, with this difference, that the tonic is here not very distinct; but whatever the characters common to music and poetry may be, he correctly says, it is in music alone that we can study with precision the mathe-

matical laws controlling the pitch of sounds. He sketches very rapidly the transition from the natural gamut to the Ptolemæan gamut, and then enters upon an examination of the theory of the natural gamut as explained by the Abbé De Lescluze,—a theory which is the more important, as this last-named author has based on the same conception a theory of colors.

This is not the place to expound the last-named theory, even if I could do so in a few words; but it is very clear that this question of the relation of music to painting is sown with snares, as the many divergent explanations it has received show. If the two stimuli, sound and light, have as their base the same physical element, viz., vibration, their elaboration in the sensory organs has differentiated them strangely, and the translations which have been made of them in the brain are not exactly comparable. Musicians cannot speak of color, or painters of *timbre*, save by metaphor. The gamuts of the painter rest on two principles, coloring and illumination; that is to say, on the order of the wave-lengths and on the degree of saturation; and they are thus, by their composition, quite different from the musical gamuts and render any complete comparison between the register of colors and that of sounds difficult. And if these difficulties did not prevent our discovering an analogy between the two, they yet indicate that we must be on our guard against misunderstandings into which language can lead us.

But we hasten to add, the question is not that of exhaustively comparing excitants and sensations; the sole thing at issue for a rational theory of æsthetical affinity is to discover a "law of rhythm" which shall be the same for the hearing as for vision. One point already gained is that there exists a law of rhythm for each one of these two senses; but it is legitimate to push the analysis farther, and I also am of the opinion with M. Lechalas that we are not pursuing a chimera in attempting to reduce sensibility to mathematical formulæ, although this reduction has hitherto not been accomplished save in an imperfect manner and by the aid of hypotheses.

I shall not speak of the last studies of M. Lechalas's work, viz., "Art and Curiosity," "Art and Ethics," despite their interest-

ing character, as this would lead me too far. The book is truly one to be read.

* * *

DR. PAUL RICHER of the Academy of Medicine, to whom we already owe a rare and beautiful illustrated work, "Art and Medicine," begins with an *Introduction* an important collection of books which is to bear the title of *The Human Figure*.¹ It is to be devoted to the study of the human form in all its aspects and all its conditions as well as to the history of its representation by the artists of all times and countries. Scientists and writers on art will contribute to this collective work, which will be profusely and very carefully illustrated. I therefore expressly call the attention of our readers to this interesting enterprise. The introduction which is offered to them treats in particular the study of the nude, of the relations of art and science, and of the problem of æsthetics connected therewith. M. Paul Richer looks forward with confidence to the future of art, which in his opinion is bound up with the future of science; and he shows himself in this attitude to be diametrically opposed to the discouraging opinions of Taine and Renan.

* * *

In connection with these books on æsthetics, I shall mention a thesis presented to the University of Berne, Switzerland, by M. PAUL PETEUT, in which this author expounds the doctrines of the Abbé Baptiste Dubos (1670-1742) as a sort of contribution to the history of æsthetic doctrines in France. Dubos, according to German authors, is the most widely cited of our æsthetic writers, and his influence on German æsthetics is unquestionable. This little work, which is a very good *résumé* of its subject, comes at the right time and deserves to be well received.

* * *

I had some criticisms to offer on a former philosophical work (*Que sais je?*) of M. SULLY-PRUDHOMME, one of the rare poets of our day, and an enlightened and interesting spirit. His present volume, *Le problème des causes finales*, is the fruit of a noble effort,

¹ Paris, Gaultier-Magnier. When no publisher is mentioned, it is understood that the books are published by F. Alcan.

and of a penetrating thought. It is made up of letters addressed to M. Charles Richet on the occasion of an article published by the latter in the *Revue Scientifique* under the title "L'effort vers la vie et la théorie des causes finales." M. Sully-Prudhomme analyses the concept of finality with great skill and points out the conditions under which this concept remains scientific and at what moment it becomes metaphysical. He endeavors to present a just criticism of determinism as well as of that doctrine of final causes which involves "liberty," or the new character of an act independent and "conditioning." He asks "how can there have arisen in him the consciousness of that sort of activity which in the determinist conception of the universe not only does not exist but, right the contrary, is the negation of what exists, viz., universal determinism?" His poetic instinct recoils from renouncing the salvation of things, "which I would not believe to be chimerical," he says, "save in the last extremity." In the course of his patient discussions he has ingenious comparisons to offer and many profound *aperçus*; thus, for example, he remarks that mind and matter, which appear to us to be irreducible one to another, when we consider them in their phenomena, actually tend to become identified when we descend regressively to the substratum. He is inclined accordingly to monism.

He also emphasises the remarkable and evident fact of the contradiction which inheres in the data of metaphysics; but he does not to my mind draw with sufficient boldness the conclusion which must be drawn for the necessity which forces us to include our judgments under the category of antinomies. Occupied as I myself am at the present moment in pondering anew upon the problems of which M. Sully-Prudhomme here treats, I find that my thought is at times in agreement with his and at times finds its consummation in it. Many readers, I believe, will derive profit from the reading of his book, even though some will not accept its prudent reservations or others its inspiring idea.

* * *

M. PAULHAN adds a new volume, *Analystes et esprits synthétiques*, to his beautiful series of works on character. It is perhaps the

most interesting of them all. He studies here with care and penetration the two classes of men who are distinguished by characteristic tendencies toward analysis or toward synthesis. He describes the different types, examining their good qualities and their deficiencies, and finally he shows how these two types of mind, so much opposed to each other in their striking manifestations, are at bottom complementary and accomplish by their joint labor the entire work of the mind.

I might perhaps have some objections to make regarding the attribution of one of these types rather than the other to such and such painter or musician. It is at least interesting to observe that the painter Eugène Delacroix, "synthesist" for example, had no taste for the methods of Victor Hugo, although they were quite similar to his own, and preferred the classical Racine to this god of the romanticists. The literary judgments of a painter may involve the appreciation in poetry of other qualities than those which he possesses in his own art, and it is difficult to say of any given individual that his nature is absolutely synthetic or analytic if we take him in his entirety.

As to the classification of characters, the work of M. Paulhan nevertheless affords us the most important distinction which can be made, when we come to consider exclusively the intellectual qualities of the individual. Hitherto he had distinguished minds as logical and illogical, which was a different mode of estimating the qualities of the intellect. But this second point of view is of secondary importance as compared with the other,—at least, in so far as the correctness or incorrectness of the intellectual operations is not concerned with the operation and the union of elements put into play either by an analysis or a synthesis.

Correctness and incorrectness, moreover, depend also on the quality of the affective and sensorial data which enter into the operations of our mind, and for this reason the value of our judgment may be influenced by our affective character. Everything is connected together in that living synthesis which each one of us is,—sentiment, thought, and action.

In a volume entitled *Essai d'une philosophie de la solidarité*, a collection of lectures and discussions by M. LÉON BOURGEOIS and others, we shall not find much light on the problems which the word *solidarity* suggests; in fact, the extreme confusion of ideas relative to this problem is very evident from the work. None of these discussions appear to be practical, and I see in them only the ingenious exercises of sociological thought, pretty much as the controversies of the Middle Ages were ingenious exercises in metaphysical dialectics. The idealogues go their way and life goes its way. Practice creates every day more facts than our hesitating theories explain. They are baffled by the wealth of the social facts that spring spontaneously from the necessities of existence, and cannot profit much from oratorical tilts. Moreover, solidarity is a fact, but the feeling for this fact is not in itself a virtue, neither can the expression of this fact form a doctrine. As long as pity, compassion, and love are mingled with the sentiment of solidarity, it will merge itself in the good old "charity"; as long as we treat of these things by the way of science, it is nothing more than a special point of view of sociology.

* * *

From the pen of M. KARPPE, a scholar of great erudition, we have *Essais de critique et d'histoire de philosophie*, treating of Philo and the early Fathers, of the ideas surrounding rising Christianity, Maimonides, Richard Simon, Spinoza, etc.,—an interesting volume the reading of which I very strongly recommend.

* * *

M. CAMILLE BOS has chosen as a subject for study *The Psychology of Belief* (*Psychologie de la croyance*). He shows belief to be connected with our *activity* as expressing it in all its degrees and transforming itself and elevating itself according as the individual frees himself from automatism and becomes more personal. Our belief, he says, is the force which moves the world; it expresses our progressive faculty, it supplements our ignorance of the universe, and adds itself to our science in order to fulfil it. It will exist, therefore, as long as contradiction and incertitude exist for human reason, which is tantamount to saying that it is indispen-

sable to our reason, and it transcends logic and expresses the very postulate of life.

* * *

M. PAUL LAPIE devotes a large volume to the subject of *The Logic of the Will* (*Logique de la volonté*). I can only indicate his point of view, which is to show how the act of willing depends on our judgments and how all the characters of will are explained by the characters of our judgments, so rendering it necessary for us to resort to a mysterious power to explain human action.

* * *

M. E. GOBLOT recapitulates in his *Justice et liberté* the elementary truths of ethics and expounds them with originality and force. I shall note here in passing the reaction which is manifesting itself in psychology in favor of intellectualism. It is one of the phases of the inevitable alternation which theories undergo. The notion of the unconscious has succeeded the classical division of the faculties of the soul, and in its turn this notion of a physiological motor is tending to resolve itself for certain authors into the study of directly apprehensible operations of the mind.

* * *

M. ADOLPHE LANDRY discusses very tersely the problem of penal responsibility (*La responsabilité pénale*). He dismisses the ancient doctrine of expiation by punishment and sees in punishment only a means by which society has endeavored to combat crime. The notion of degrees of responsibility is undoubtedly connected with the classical doctrine, that punishment, being expiatory, should be proportioned to the offence committed. But it is also justified from the point of view of utility, according to which punishments should be chosen that are most useful socially. In practice we did not arrive at this result by *individualising* punishment, as certain criminologists have suggested. It would be more advisable to establish degrees of responsibility and "to divide the subjects for punishment into classes, the same treatment being reserved for all members of the same class"; the penal treatment, on the other hand, would be so calculated as to assure intimidation

and example; and the classes would be established by taking account of the complicated data of the problem.

I will not treat here incidentally of so grave a question; some day the occasion will present itself for our returning to it. Yet let us be careful in every reform not to efface from the law its moral signature and its high character of duty. Let us not *demoralise* either the act or the punishment; this would be contrary to social utility; and I make this criticism without accusing M. Landry of not having recognised it.

* * *

From DR. J. J. VAN BIERVLIET, whose *Studies in Psychology* I should have mentioned before, we have a series of excellent *Cause-ries psychologiques*. The learned author recapitulates here in clear form and concise language the results of the experimentalists on the following different subjects: the reverse sides of joy and sadness, the problem of memory, and the forms of embarrassment.

We have from M. ANDRÉ MAYER an *Essay on Thirst* (*Essai sur la soif*), an excellent review of which by Dr. Dumas will be found in the *Revue Philosophique* for June, 1902; from M. BOURDON a volume on the *Visual Perception of Space* (Paris, Schleicher, publisher); from M. G. ENCAUSSE (Papus), *L'occultisme et le spiritualisme, théories philosophiques et adaptations de l'occultisme*, illustrated with figures, one of which represents the physical organs of the *astral man*!

* * *

The Historical Collection of Great Philosophers has two new volumes, one by the ABBÉ LAFONTAINE entitled, *Le plaisir d'après Platon et Aristote*, an excellent work in philosophical analysis, justifying and consummating the doctrine of Eudemonism; and the other by M. PAUL LOUIS COUCHOUD on *Benoit Spinoza*.

M. XAVIER LÉON gives us *La philosophie de Fichte*, an extensive work to which M. Émile Boutroux has added a preface. M. JOSEPH FABRE begins in *La pensée antique, de Moïse à Marc-Aurèle*, a sketch of the evolution of human thought; his work is composed mostly of citations.

The *Année psychologique* and the *Année sociologique* still continue to be valuable and complete; they are indispensable to all workers in this field. The last-mentioned volume contains two original memoirs, one by M. SIMIAND, *Étude sur le prix du charbon en France et au 19 siècle*; the other by M. DURKHEIM, *Sur le totémisme*. M. Simiand's study is an essay, which I can highly praise, on the precise determination of an important economic phenomenon. M. Durkheim labors to fix precisely the notion of totemism by taking up anew the criticism of the facts gathered by Spencer and Gillen in their beautiful book on the central tribes of Australia.

The *Année philosophique* comprises studies by M. BROCHARD, *L'œuvre de Socrate*, by M. HAMELIN, *Sur la logique des Stoiciens*, by M. ROBIN, *Le traité de l'âme d'Aristote*, by M. DAURIAC, *Essai sur la catégorie de l'être*, and by M. PILLON, *La critique de Bayle, critique du théisme cartésien*. The French bibliography for the year 1901, which is entirely the work of M. Pillon, contains not less than one hundred and five works. This is more than we mentioned in our "Correspondence" for that year, but I have no reason to regret the omissions. I am compelled to choose among many works which are not at all deserving of the same degree of attention. My principal object is to review philosophical questions in connection with a few important books, so far as this is possible for me.

But I shall add several names to my list taken from the bibliography above mentioned: ARVÈDE BARINE, *St. Francois d'Assise et la légende des trois compagnons* (Hachette, publisher); H. BREMOND, *L'inquietude religieuse, Aubes et lendemains de conversion* (Perrin, publisher); CHARLES BYSE, *Le prophète du Nord, vie et doctrine de Swedenborg* (Fischbacher, publisher); G. FULLIQUET, *Les expériences religieuses d'Israël (ibid.)*; JEAN RÉVILLE, *Le quatrième évangile son origine et sa valeur historique* (Leroux, publisher); M. MURET, *L'esprit juif* (Perrin, publisher); E. FAGUET, *Problème politique du temps présent* (A. Colin, publisher); and last but not least, the beautiful work of M. E. BOUTMY, *Essai d'une psychologie politique du peuple anglais* (A. Colin, publisher).

LUCIEN ARRÉAT.

PARIS, FRANCE.

CRITICISMS AND DISCUSSIONS.

THE CONTRARY AND THE CONTRADICTORY IN BIOLOGY: A STUDY OF VITALISM.

The continued and frequent discussion quite recently of the subject of Mechanism and Vitalism indicates that the problems involved, notwithstanding their fundamental theoretical importance for the biological sciences, are either not yet satisfactorily solved, or, as also may well be the case, are misconceived and misstated. This state of affairs is due, we believe, to the fact that purely methodological principles are not taken into sufficient consideration in the attempts to reach a solution. This view is confirmed in the instance of a work before us,¹ where both a clear analysis of the nature and a consistent and systematic treatment of the problem are absent, notwithstanding that much of value is presented. Once prior recognition of the importance for the problem of considering methodological principles is made, the same length of discussion and criticism that are usually connected therewith would not be necessary.

In justification of our statement we find that, for instance, Bütschli, after admitting the existence of no essential difference between neo-vitalism and vitalism, since for him both are characterised by the acceptance of the presence in the organism of a special "prinzip" or "force" or "Geschehensgesetzlichkeit," wholly absent in inorganic things, states that both views also admit the validity of a *causal* (kausal-mechanistisch) construction of life phenomena; for both agree in making "vital force" the *cause* of these phenomena. Accordingly on the basis of fundamental methodological principles we find that, if the presence of this special "causal-acting," "law-following" vital force is the essential and specific attitude of the organism, then vitalism in no way contradicts mechanism (i. e., the theory and laws of energy) or makes impossible the application of its principles to organic phenomena, but on the contrary not only that the two theories are quite compatible and both can be true at the same time, but that vitalism must in fact even be subsumed under mechanism.

The ground for this assertion lies in the general logical doctrine of classification, of which there are two well-known methods, viz., logical and dichotomous, or

¹ *Mechanismus and Vitalismus*, Bütschli, Leipzig. 1901. 104 pp.

disjunctive. According to the former two or more classes are subsumed under a genus as coördinate species upon the basis of certain both common and different (resp., *conferentia* and *differentia*) yet in each case *positively* characterised qualities, giving, according to strict logical terminology, *contraries*; in the second method the *differentia* of one or more of the coördinate species are determined *negatively* with reference to those of another, forming *contradictories*, of which there can be only two. In this procedure that class or those classes which are characterised *negatively* in the dichotomous division must prior to this be recognised as different from the others upon the basis of *positively* existing attributes, i. e., they must be proven to be really existing classes upon another basis than that of the negation of that of which they are the contradictory. It is evident from this, then, that in each case the classes are subsumable under one and the same genus which is made up of the *conferentia* that exist side by side with the either *positively* or *negatively* presented *differentia*.

There is a distinction, therefore, between *contraries* and *contradictories*; the former affirm the essentiality of definite positive yet different attributes for two or more species; the latter negate this essentiality for one or more classes of attributes which are necessary for another. As examples of the two we have, as *contraries*, the members of the color series, red, blue, violet, etc., lines straight and curved, showing, as above stated, that they may be many or reduced to two; as *contradictories*, monovalent and non-monovalent atoms, red and not-red things, straight and not-straight lines, prime and not-prime numbers, *showing that the negative class would, if the positive characterisation were made of it, really include or be identical with one and in some cases many classes, i. e., contraries*. But according to both methods, however, the species are coördinate because of the existence of *conferentia*, as, in the examples, of valence, color, line, and number; i. e., the contradictory of straight, not-straight, does not include everything except a straight line, as, e. g., Galileo, Sistine Madonna, Arion, Perseus, etc., but only curved lines, which form the contrary.

These principles of method, *first*, that in the case of both *contraries* and of *contradictories* *conferentia* exist which form a genus, so that *genus and species cannot possibly contradict*, and, *second*, that it is *always possible to convert the logical into the dichotomous division* by passing from the positive to the negative determination, *from the contrary to the contradictory, and vice versa*, these principles should be continually borne in mind in the examination of the arguments for a "vital force" and in our own attempt to make clear the nature of the problem of the relation of vitalism to mechanism.

As preliminary to the application of these principles we must, however, establish as clearly and definitely as possible the meanings which, whether from logical necessity or from pure arbitrariness, nevertheless as a matter of fact, attach themselves to the forms we shall use; for *mechanism and vitalism can be contrary to or contradict each other provided only that they are related as coördinates and*

not if the latter is subordinate. Both of these latter relations might, however, exist at the same time were one of the terms ambiguous, having a narrower and a broader meaning, as is to a certain extent the case with mechanism, and could the assumption of a "vital force" be really justified. However, to investigate the grounds which are offered as demanding such an assumption and to show that after all the conclusion from these is an *invalid* immediate inference and so to demonstrate the real nature of the origin of vitalism, this forms a large part of our discussion.

Bütschli does not admit the existence of any ambiguity in the term *mechanism*, but *distinguishes it from mechanics*; the latter is the science of the phenomena of "equilibrium and motion" (p. 7), i. e., kinetic energy; the former is more general; it means to "understand" and "explain" upon the basis of the necessary assumption of a *causally* and *uniformly* acting something (*Geschehenswesen*), and he derives from this the adjective *mechanistic*. We are of the opinion that the distinction here made is one not always recognised, and thence comes the possible ambiguity of the term mechanism. However, it corresponds essentially to that made by many recent authors between Energetics on the one hand as genus, and the sciences of the various energies, e. g., Electrodynamics, Thermodynamics, etc., on the other as species, i. e., between the science of the common qualities of all the energies, chemical, "distance," osmotic, kinetic, as genus, and the special sciences of each one of these as species. The *conferentia* of all these specific energies, i. e., of energy, are the *interdependent attributes of regularity and uniformity, causality, conservation, "equalisation of uncompensated potential differences,"*¹ "*shortest time*," "*greatest working*," and, as empirical investigation has shown, *dissipation*, i. e., increase of *entropy*. *Mechanism can be identified with Energetics* in this above meaning and so distinguished from mechanics, and if we do this we have at the same time made clear the logical necessity (*Naturnothwendigkeit*) and justification of accepting the above attributes as making up the meaning of mechanism: for these attributes are, at least some of them, fundamental, ultimate, lying at the basis of and conditioning any science of nature, and without them no "understanding," no "explanation" is possible. Making this identification the result is, in accordance with our methodological principles, that vitalism, if it means the theory of a "vital force," supposing this to be justified, can neither contradict nor be contrary to mechanism, but only to mechanics, the science of the specific energy of moving mass-points, and to the sciences of the other energies, any one of which, according to the methodological principle we have stated, may be either contrary or contradictory to the others according as a positive or negative determination is made; i. e., the contradictory of mechanical, non-mechanical, includes, and can be converted into, as contraries, all the other energies, electrical, chemical, etc., and vital, too, if it exists, as can also non-electri-

¹ See Ostwald in various places.

cal, and so on in turn, so that *vitalism stands logically as a contrary obtained by converting the contradictories of each of the other energies.* However, this is in itself by no means a proof of the existence of a "vital force," but nevertheless these relations should be especially remembered in endeavoring to find any justification of the theory. From the above it is again seen that vitalism must also be subsumed under mechanism, as follows also from certain other admissions of the vitalists, as found stated by Bütschli, viz., that events in the organism are *quantitative* and take place in entire agreement with the law of *conservation*, and that the "vital force" is conditioned by and transformed out of and into the other energies.

The above seems to us to be the only possible logical relation consistent with methodological principles which a "vital force," providing it were first unquestionably proven to exist, could bear to mechanism on the one hand and to mechanics and the other specific sciences on the other. While, therefore, our argument has thus far been largely *ad hominem*, the important question remains to be decided *ad rem*, as to whether there is any justification for the acceptance of the existence of yet another distinct energy form, and to ask if it is not perhaps rather the result of an *invalid conclusion* from the impossibility of proving, e. g., "A" in detail on one side, i. e., from the "not-proven" or "unproven," to the "provenness" that "A" is *not* and so from this to the proven existence of the contrary "B" on the other.

The dispute centers therefore first about the possibility or impossibility of completely explaining (*begreifen*) the organism upon the basis of the at present generally accepted energy-forms, and so again demands a preliminary definition of terms. First, the meaning of the term *cause* is to be made clear, for even the vitalist considers his vital force to be causal. We find that our author (p. 10) distinguishes two kinds of causes (a) a "working" and (b) an occasioning (*auslösende*), besides (c) also conditions, for every event. To the first of these he makes the quantitative identity implied in the principle of conservation applicable, but he fails to realise that the other two, occasioning cause and conditions, are also ultimately reducible to the first, that they are also in turn only effects of "working" causes. Second, the concepts "describe" and "explain" are to be considered. Here our author (p. 14), reverting somewhat to Kirchhoff finds that "description" means to present (*aufzählen*) the spatial and temporal contiguity of things and events; that explanation also does this, but in addition thereto attempts to discover relations of causality, thereby becoming "causal description." But although this distinction is valid and our author has already expounded "causality" to us, he does not in any way suggest a practical criterion for the discovery of such relations, but, as so many scientists and philosophers before him have done, begs the entire question in the assertion, that when one event follows another with *logical and empirical necessity* then the first is the *cause* of the second: for the very essence of the question here is, how can *such a necessity* be brought to light? Nor is this criticism of Bütschli rendered invalid by his second definition of explanation

viz., that it is *subsumption*, for, as we indicated in our discussion of methodological principles, this is conditioned by the existence of *causal* relations, i. e., the first kind of explanation. Therefore a real practical criterion for detecting causal relations and so of explaining is not offered by Bütschli. That, however, there is such a criterion, viz., the quantitative identity existing between events which is implied in the fundamental attributes of mechanism or energetics, and that the discovery of its importance and its use by the physicists has been a chief factor in the development of modern science, this we would emphasise as bearing directly upon the question of the possibility of *explaining* the organism. Explanation is, we must conclude, the establishment of relations of cause and effect among phenomena, which relations are characterised and discovered by the presence of a quantitative identity and its implications, these relations and characteristics not being themselves explainable but only constitutable.

Can the organism, then, be explained? One thing is certain, and that is, that it cannot be unless the factors which condition or are identical with explanation elsewhere, viz., mechanism, its implications, and its subordinate energies and the *essential* characteristics of each, are also made use of here. But it must also be admitted that direct quantitative determinations cannot be made in the organism to the same extent at least that is possible elsewhere. This brings us in a way to the *crux of the matter*, to the question as to whether or not this impossibility of making as detailed and complete quantitative determinations of organic events as we can of inorganic prevents the subsumption of the organism under mechanism, and if it furnishes valid grounds for concluding to the existence of a "vital force." In answer to the first part of the query we may cite examples of the practice of those sciences which for the most part only describe things in their spatial and temporal contiguity and offer few "causal" descriptions on account of the complexity of conditions, etc. Thus geology and mineralogy do not for such reasons in any way deny the validity of the principles of mechanism and the laws of the specific energies for their phenomena, but, on the contrary, recognising the impossibility of proving this by direct investigation for every detail of not only "prehistoric" events but also of present occurrences on account of their complexity and extent, accept the validity and make all possible use of both the general causal principles and the specific causal laws for all phenomena in their respective fields of research, and admit that everything takes place in full agreement with these and as a result of the coexistence of the at present accepted energy forms, of whose modes of action these specific laws are only expressions. It is in this way, for instance, that geology calls to her aid both chemistry and physics.

It is evident that here we again have to deal with a methodological principle which we may state as follows: that, as a result of that unity of all the sciences which comes from their being phylogenetically dependent on the same psychological (*Kausalitätstrieb*) (cf. Plato and Aristotle) and factually on the same logical conditions, viz., the assumption of the uniformity of an independent dynamical

principle in nature, and consequently in accordance with the principle of analogy (the ultimate method of all induction) that the laws and conclusions of any one science are extended in their application to every other science which deals, if only indirectly, with the phenomena dealt with directly by the first, and that these laws retain their validity in this extension until contradictions thereto appear as a result of independent investigations in this new and special field.

There would seem to be no reason then why biology, as one of the inductive sciences, should not proceed according to the same principle and therefore take the position that, in the first place, although the validity of the general and specific laws of the at present known energy forms cannot in every case at least be proven in every detail for the organism, nevertheless these laws hold good in every instance for these forms wherever found in the organism until this validity is done away with by independent investigations in this field of phenomena; and in the second place that these are the only energy *forms* which can legitimately be considered to be present in the organism until there is other evidence for new forms than that only of the impossibility of the above-mentioned *detailed* experimental proof. A complete *explanation*, i. e., deduction according to cause and effect, of the attributes of the organism from these of the energies not being possible, *description* must be appealed to, but the assumption of a "vital force" is not justifiable on this ground alone, though the *possibility* of its existence is therefore not to be denied, for, to put it technically, from the "unprovenness" (incomplete proof) of "A" we cannot infer the "provenness" of the contradictory "non-A" and so the contrary "B," but only also the "*unprovenness*" of the "non-A." Nevertheless upon this form of a *false* inference, as was before suggested, rest practically all the arguments of the vitalist for his theory.

There may be however from another quarter more serious objections to the possibility of *explaining* the organism than those so far discussed, viz., our as yet incomplete knowledge of chemical and physical phenomena themselves. Is this fact in itself a valid reason for accepting the existence of our hackneyed vital force? In answer to the first suggestion it is self-evident that where explanation ends in the one case it must also end in the other, but that of itself does not prevent a reduction of all physiological events to mechanism as we *now* conceive it and in the way we have above expounded. It perhaps goes without saying that there is no such thing as an ultimate explanation, but only a relative which consists in reducing certain facts of experience to others that in turn cannot be further reduced. What these ultimate elements are is the point of dispute between the "mechanical theory of the universe" and energetics, the one holding that *all* events in nature are motion, the other that *some* such events are not of this kind; therein lies the absolute contradiction between the two. However in either case all explanation becomes, as Kirchhoff pointed out, ultimately only *description*, but before we get to this we have what we call *explanation*, so that our question is: must we not accept this for the organic world also? In answer to the second question above the

same reply as was previously made must be repeated. The possibility of new energy-forms being discovered always remains, but one cannot validly conclude from that possibility and from incompleteness of detailed knowledge to the actuality of a new energy (vital force). Rather only when, having demonstrated conclusively by a process of exclusion the impossibility of reducing organic phenomena to the at present known energies, i. e., having a definite disproof of this reduction, and so having assumed that a new form exists, this energy can be measured and its factors given, (as in heat energy temperature and specific heat) then alone shall we be fully justified in accepting its existence as proven. How openly the vitalist, however, sometimes begs the question is seen from assertions like Bunge's (Bütschli, p. 16) that all those partial phenomena of organisms which can be understood (*begriffen*) physico-chemically are really not life-phenomena, and like Cossman's, that even a body made artificially out of the same stuff as plants and of the same structure would nevertheless not be an organism.

To give a more detailed statement of such a method we find that Bütschli suggests an as exact and complete study as possible, first, of the physico-chemical character of those "stuffs" which form the material basis of the simplest organisms, and, second, of those finer structure and form phenomena in the inorganic field which occur under known conditions and yet most closely resemble organic phenomena. We should then by a process of exclusion, consisting in showing that only under these conditions and under no others can the organism have arisen and continued to exist, show the unity of the organic with the inorganic. Such a method he thinks would also show definitely to what energy categories organic phenomena belong, and would prove more fruitful than the study of the simplest elementary life phenomena of growth, metabolism, etc.

It is not to be supposed that the vitalist is wholly ignorant of this method, for he is not; on the other hand he holds that its application shows him that there remains something which cannot be explained thereby, viz., the *form* of the organism and also its outer and inner *organisation*, both of which he claims can be understood only teleologically. The justification of this claim is therefore to be questioned. Bütschli's answer thereto is, that certain organic forms in both relatively static and in dynamic cases are undeniably dependent on the same factors as are the inorganic equilibrium forms of liquids and solutions, and this is confirmed by the results of some of the most recent investigations, as, for example, in artificial parthenogenesis and the development of double embryos. "Forms" are not lacking in the inorganic realm, and it is one of the fundamental principles of mechanism that "*equilibrium*" is *everywhere sought* and therefore that all the at present known energies are at least "form-conditioning energies." A specific "form energy" is to be assumed only on the conditions above expounded as proving such assumptions, and these we find warrant perhaps the acceptance of such an energy; for since the form of a body does not change unless work is done upon it, i. e., except by the use and transformation of energy, we must accept the existence of a

"form-energy" as a result of the law of conservation. But again this energy is quite as universally characteristic of the inorganic as the organic and cannot therefore distinguish one from the other or be the vital-form-energy which the vitalist is seeking. Nor can we see that Bütschli's above reply is incompatible with his subsequent statement "that the complex organic form arises in a manner which is without analogy in the inorganic realm, i. e., it develops," or that this places him in the ranks of the vitalists, as Renike has claimed. For it is certain that a "peculiarity" implies necessarily "something without (complete) analogy"; in the case under discussion the "forms of the phenomena of development" are in some respects certainly unlike "inorganic" forms; so that the "peculiarity" becomes a species-building characteristic. It might be as well one of the many differentia of inorganic bodies, for they also have peculiarities due to varying and different energy-complexes, but this does not prevent our discovering similarities, or analogies if one will, and subsuming them under the general principles of energy. "Without analogy" therefore does not mean without any but only "without complete analogy," and so implies a certain unity or similarity which shall be the very basis of the subsumption we are seeking. One must recognise that it is impossible to do away with the real peculiarities of anything, for these are facts, but we can, letting these stand, ask whether they are not the result of the coexistence of the energies we now have and perfectly compatible with mechanism in its present extension of meaning. It seems to us therefore that the vitalist, in concluding from the application of the methods we have just above presented that there is a vital force, does so because he has not really carried these methods to the limit of their valid application.

The same methodological position applies also to the question of organisation. (Cf. Bütschli, p. 72). Both organic and inorganic are organised, each individual in each realm in a way peculiar to itself, but the *fact of organisation* is at least common, and may consequently be in both cases *dependent on the same ultimate factors*. Bütschli finds that two types of organisation are distinguished by biologists, viz., a "maschinelle" (machine) and a chemical. The first of these is a concept which is derived primarily by the consideration of and abstraction from the parts of a machine and then applied by analogy to the highly complex and also simpler organisms. The difference here is at best one of degree only, and (p. 73) is ultimately dependent (in part) on a different chemical organisation; for that certain characteristics of inorganic bodies are so dependent is universally proved and accepted; viz., color, transparency, polarisation, cleavage, form of crystallisation, etc.: in the organic some if not all of these are present and therefore in agreement with the principles we have stated are to be considered as likewise so dependent. But for the organism there has been claimed in addition to these also a peculiar *structural* organisation of the "*ultimate vital elements*," such as "plasomes" (Wiesner), "biophores" (Weismann), "pangenes" (de Vries), in the assumption of which we find only question-begging epithets and a circumvention of the prob-

lem ; for that which is even put in question, viz., the existence of a vital force, is assumed without proof in these names.

It is nevertheless doubtless correct that the individual characteristics of the organism are dependent upon the "maschinelle" structure of the cell in so far as this is a complex of nucleus, centrosomes, cytoplasm, etc. (cf. Bütschli, p. 76) ; yet so are the characteristics of a galvanic cell similarly dependent upon its various parts, but this does not in itself mean the presence of differentia which are not reducible to our present energies. Likewise the question must be raised in the case of the organic cell as to what the ultimate nature of the nucleus, centrosomes, or plasomes, biophores, etc., is. To stop with them as *vital* is to beg the question. Admitting the existence of such units and the fact of their *chemical* organisation, this latter, though it be peculiar to itself in the same way as is every chemical compound in its structural formula, is to be conceived of only as in agreement with chemical principles and therefore with mechanism (energy). Such a "peculiar" (i. e., individual) chemical organisation together with the other energies necessarily coexisting with it (form, volume, heat, electrical, and perhaps osmotic) (cf. Ostwald), therefore conditions all the external manifestations and relations of the organism in a way quite analogous to "peculiar" inorganic instances. Here again we are arguing by analogy, but only such analogy, i. e., "similarity in diversity" or "identity in difference," as lies at the basis of all reasoning in the inductive sciences, as we have before pointed out. For example in chemistry, every structural formula is in some respects different from every other and so peculiar to itself ; by *analogy* it is accepted as valid for all molecules (groups of) manifesting the same characteristics as those bodies from the study of which it is obtained ; and by *analogy*, i. e., because of the similarity it bears to other formulæ in the matter of valence, etc., it is brought under the same *general* principles of chemistry and mechanism as are other structural formulæ. Biology must use the same method of procedure, and doing so and letting the peculiarities of the organism as a whole stand, but demonstrating the similarity of each one of these to those found in the inorganic world, ultimately show if possible that the at present known energy-forms suffice to account for the organism, and if not, in just what respect the insufficiency consists. Certainly neither the form nor the organisation can be held at present to form such an exception.

Lotze admitted that an accidental (*zufällig*) origin of the organic from the inorganic was conceivable for the simplest though not for the higher organisms, from which he implied, making "purposeful" identical in meaning with the contradiction of accidental, i. e., non-accidental, that there is in the higher forms at least a "force" which accounts for their purposefulness. Bütschli himself holds that the direct origin of organic forms out of inorganic, which forms should be capable of further development, is thinkable, although these forms would not be identical with the simplest forms which we know to-day ; such an origin however does away with a force or energy distinctly vital. Bütschli, to answer Lotze, recognises the neces-

sity of first establishing the meaning of the term "accident." He considers correctly, we think, that this concept does not exclude causality and regularity, but that it means an event which cannot be predicted or whose exact connection with other events cannot be shown on account of the complexity of conditions, etc.; i. e., notwithstanding incomplete knowledge and the absence of definite measurements, causality and the other principles of mechanism are still looked upon as holding good for these events. The inorganic world is therefore both accidental and non-accidental, and causal, and whatever the origin of the organic world may be, either accidental or non-accidental, in neither case is anything implied either for or against the existence of a vital force, for this latter would in any case be causal, etc. Consequently to think to support its assumption by identifying *non-accidental* with purpose is to make use of a manifestly invalid inference. For in the first place the *possibility of prediction* with which Lotze would be *obliged* to identify it is quite the opposite of that which is usually accepted to indicate purpose, and in the second this latter concept is used without first ascertaining its exact meaning, and if it is not really quite as compatible with accidental as with non-accidental and in any case with causality.

Admitting a purely physico-chemical origin for the simplest organisms, this explanation would, from the facts of organic continuity and development, apply also to the higher organisms and the processes of reproduction and development upon which their evolution is dependent, even though these processes are without *complete* analogy in the inorganic realm. Yet it is because of the seemingly extraordinarily purposeful and complex nature of at least these higher organisms that a metaphysical or teleological principle has been assumed and its function ascribed to a vital principle, a *Zielstrebigkeit*, a *Bildungstrieb*, etc. (cf. Bütschli, p. 29). Thus the step from purpose to vital force is made, which step would be valid only providing the presence of purpose were really proven to be a universal characteristic of the organism, this purpose could not be explained on the basis of our present energy-categories. The criticism which we find in Bütschli on this point is in general excellent, although in certain details open to objection. He finds, first, that the idea of purpose (teleology) is primarily derived from certain of our own psychical states (p. 29) and, second, that it has only a psychological and subjective but no universal objective validity. "End" is the general concept of something willed and implies the choice of, if possible, suitable, though sometimes of what proves to be unsuitable means for its realisation. The act is said to be purposeful especially when the desired end is attained, otherwise not. Accordingly the consciousness of the end or motive seems to be a psychical ground or cause for the purposeful act. Consciousness, therefore, and its correlate, a highly developed nervous system, seems to be a condition *sine qua non* for such acts (p. 29), for in order to be able to judge an act, an event (*Geschehen*) as purposeful, the *consciousness of an end* is the primary essential, for the attainment of which end the act is a means. In the inorganic realm, therefore, the assignment of ends is entirely arbitrary and

unjustifiable, for here the essential condition, consciousness, is absent, and the only assignable purpose for an event, if one will insist on using the term, is that it should happen. This necessity of the presence of consciousness for purposeful action even in the physical (inorganic) world has usually been recognised by all the philosophical writers on the subject, but they, as we also find some biologists doing nowadays, have also always attempted to evade the difficulties inherent in such an attempt by a logomachy; they have made such a *consciousness unconscious* in its nature, thereon constructing a *contradictio in adjecto*; nor have they denied its compatibility with mechanism.

The conclusion from this is then that the concept of purpose cannot have a meaning for the organism in its entirety, for certainly not every part of this has a conscious side; the most one can do is to say that its end is that it should persist and not die, at least until it has reproduced itself. The same might be said in part of a planet system, where, however, it is evident that any so-called "final cause" is identical with efficient causes, and therefore in a way superfluous, having only a subjective but no objective basis.

"Purpose" may seem to be more evident, however, in the "services" which a single organ performs for the entire organism, but here as elsewhere the assertion of purposefulness is a conclusion reached by assuming the existence of something analogous to the conditions for our own so-called purposeful acts, where really no basis for such analogy exists. It seems, therefore, that the presence of "purpose" is certainly not a universal characteristic of the organic realm, and that it consequently cannot be used in support of or identified with the long-looked-for vital force, which must at least be coexistent with the entire range of the organic.

On the other hand, to attempt to show that purpose is contradictory to mechanism is impossible for the very reason that our analysis and criticism of the former concept assumes the compatibility of the two as necessary; for our own "purposeful" acts, being conscious, depend, if we accept the theory of psychophysical parallelism, upon purely *mechanistic* (physiological) factors, a position which would not be altered even if the existence of a "vital force" should be proven on other grounds. If one and the same act is therefore both purposive and mechanistic, these can be only two different points of view. The former is, like the concept of the beautiful, a purely subjective, incomplete standpoint, oftentimes invalidly identified with indeterminism; the latter, that of mechanism, is an objective, ontological, explanatory, epistemological category, an ultimate and universal principle of all knowledge of nature, as we have previously indicated. They are two distinct principles of classification whose application does not necessarily lead to contradiction, any more than would weight and color if used as principles for classifying objects. This view of the matter is taken by the biologists themselves, e. g., Pflüger, who inculcated it in his *teleologisches Causalgesetz*, in which both purpose and mechanism are implicit, and Bunge, who according to Bütschli, admits that everything in the

organism, except the psychical, is "mechanistisch." Bunge, however, is a vitalist in a peculiar sense, as is seen from his statement that "the essence of vitalism consists in starting from the inner world," "the known," and that "in activity lies the secret of the organism," in which statements he identifies the vital force with consciousness, which should account for the purposefulness considered to be present. To be consequent, then, Bunge would be obliged to make consciousness co-existent with life and so swallow the "unliquid draught" of unconscious consciousness. In Reinke we meet an interesting modification of the argument for a "peculiar something" in the organism. (Cf. Bütschli, p. 103.) According to this author's theory of "dominanten," the distinguishing characteristic of the organism is a *Maschinenstruktur*; in a machine there are *Kräfte* which *link* the energies there present together and *direct* them to a *certain end*; these forces are the expression of the intelligence which was necessary in making the machine and can be interpreted only as unconscious intelligence (Reinke, '99, p. 113), i. e., conscious intelligence in the maker becomes transformed into unconscious in the machine. Such "dominanten" in the organism therefore should *direct* its phenomena and distinguish it from all inorganic nature that is not applied by man in his engineering products. In this theory we again meet the view that *purpose* demands intelligence of some kind, but here it is supposed to "link" and to "dominate"; but on the other hand, the doctrine of the *transference* of the intelligence making the machine to the machine itself is something quite new, and, we think, invalid. It implies a "conservation" or transformation of consciousness, which in a way contradicts the dualism upon which the theory rests principally, for *conservation* means *correlation* among different energies, which on the psychical side is impossible if dualism is true, and *vice versa*. Reinke's theory contains therefore a certain *contradictio eo ipso*.

At the conclusion of our inquiry in which we have considered, we believe, all the typical arguments for a "vital force," the following summary of the status of the problem seems to be justified. The strife between the two views of vitalism and of "non-vitalism," i. e., mechanism in its present extent of meaning, will probably continue until the time is reached when every detail of life phenomena is known and can be measured and predicted. For in the first place, while there is yet such a lack of knowledge of detail, there remains always the possibility of new energies being discovered, and the vitalist overlooks the fact that even if they were they could not contradict or be contrary to mechanism, but only to mechanical (kinetic) and the other energies. This results from the principle that only coördinates but not subordinates can exist in either of these relations. This being so, the possibility of passing by conversion of the contradictory of each one of the energies, non-kinetic, non-chemical, etc., to "*vital*" as the *contrary* always exists. This possibility is in itself, however, not a proof of vitalism, but indicates only the relations which would really exist were proof from an independent source offered and at hand. But the typical vitalist uses it, perhaps unconsciously, in concluding (inval-

idly) from the lack of complete proof that the organism is made up only of our at present known energies, i. e., from "A" to the contradictory proposition "non-A," that the organism is *not* so made up, as proven, and then by concluding by conversion of "non-A" to "B," the contrary, that a vital force exists. This reasoning is *invalid* for the reason that from the *unprovenness* of "A" *only the unprovenness* and not the provenness of the contradictory "non-A" results, e. g., if it is not (un)proven that two lines are *equal*, their inequality also remains unproven; on the other hand, if the supposition of their equality were *disproven*, then their inequality would necessarily follow. So likewise if the assumption that the organism is a complex of only those energies which we now accept were definitely *disproven*, then, by virtue of the same relations of contradiction, we would all have to accept the existence of a "vital force," although we would perhaps know nothing *about* this and have no *confirmation* of its existence until its factors, etc., were discovered. But not one of the factors considered by the vitalist to furnish such a disproof because of their being supposedly irreducible to our energy categories has stood the test, for it has been possible to show by that principle of identity in difference or of analogy which underlies all inductive method that these factors are so reducible. On the other hand, that there is *confirmation* of the vitalist's claim, no one would venture to assert. It is then the use of the principles of the contrary and the contradictory and based upon this the *invalid* inference from the incompletely proven, i. e., the unproven, to the provenness of the contradictory and then, by conversion, of the contrary, that *characterises*, we believe, *all the arguments for a vital force*. This reverses the direction of the valid use of the principles of classification we have expounded, the correct practical use being first to confirm the existence of a vital force and then to place it in its proper position in the classification.

However, we find that in the absence of a detailed proof and explanation of the organism as made up of our at present known and definitely confirmed energies certain methodological principles having to do with the range of validity of a law compel us to accept such a dependence for the organism. From this standpoint, then, the organism is to be considered as a peculiar complex of energies, all of which are found elsewhere in various coexistences and relations to each other and therefore conditioning various peculiarities, but nowhere else do they present the same peculiarities as does this peculiar complex, the organism, present. Chemical, electrical, and osmotic changes, surface tension, movement, etc., are all found elsewhere, but only all together in the organism. Equilibrium is here always sought and gained, causes becoming effects with no loss of energy and in the shortest time, i. e., the organism is a mechanism. Vitalism at present, then, remains without justification, and its assumption can be the result only of the ignoring of methodological principles and consequently of invalid reasoning.

EDWARD GLEASON SPAULDING, PH. D. (Bonn).

COLLEGE OF THE CITY OF NEW YORK.

SEMITIC ORIGINS.¹

Semitic Origins!—a title which at once challenges not only our curiosity but also our attention. All we know so far about the Semites was that they invaded Babylonia in prehistoric times, coming probably from Arabia, their original home. When invading Babylonia they found there a religious system, social forms and governments which were the highest possible, and which they—the Semites—accepted in course of time. Whether the Semites brought with them some ideas of their own as regards their religion and social forms nobody, so far, has been able to tell us. Barton's book, therefore, would be a most valuable contribution towards the study of religions—not only of the Semitic but also of the Sumerian—if he had shown us or presented to us the specific Semitic and Sumerian elements in the religion to be found in Babylonia.

Barton discusses in the first chapter of his book the "*cradle of the Semites*" and finds, p. 28, that we must hold to the Arabic origin of the Semites. From these Semites as a whole parted the northern Semites—the Babylonians, Aramæans, and Canaanites—settled in Babylonia and the neighboring regions, where they lived together for a long period. The Aramæans were the first to separate from the main body of the emigrants; at a considerably later period the Canaanites, and, last of all, the Assyrians."

Do the inscriptions testify to the accurateness of this statement? Partly they do, and partly they do not. In the oldest Sumerian inscriptions we find traces of Semitisms—hence Semites must have been in Babylonia as far back as our inscriptions go: these Semites are rightly called by Barton the Semitic Babylonians. At about 3000 B. C. we hear however of certain gods who are not mentioned in any of the older inscriptions. These gods are Nergal, Ninib, Nusku, Nabu, and especially Dagan and Marduk. At the time of the first dynasty of Babylon, which is of Canaanitish origin, Marduk had become the chief god. Hence the second Semitic invasion goes back to the period before the time of "the kings of Ur and of the four corners of the world" or 3000 B. C., and is a Canaanitish one. The Aramæans were not known in Babylonia till about 1500 years later.

The second chapter is devoted to the discussion of the "primitive Semitic social life." What we learn about it is this (p. 79):

"The Semites, perhaps as early as the time of their separation from the Hamites, had reached the animistic stage of culture, and formed totemistic clans. Their family relations were exceedingly vague. Marriage was formed for a short term, women resided in the homes of their own kindred, and descent was reckoned

¹ *A Sketch of Semitic Origins Social and Religious* by George Aaron Barton, A. M., Ph. D. Associate Professor of Biblical Literature and Semitic Languages in Bryn Mawr College. New York: The Macmillan Company; London: Macmillan and Co., Ltd. 1902. Pages xvi, 342.

through them; the killing of female infants created a paucity of women, which produced a condition of polyandry resembling the Nair type. At the same time there was much sexual irregularity, which was regarded as innocent. Out of this there grew, through the formation of male trading clans and the influence of the capture of women, a system of Thibetan polyandry and, later, a system of male kinship."

As already stated above the oldest Semites are the Babylonian Semites. They had accepted the Sumerian pantheon, for we find that even in those inscriptions which were written in the "Semitic style," Sumerian names for the gods are used. Now it happens that there exists in the Sumerian pantheon a *well defined genealogy*—hence we have in this divine genealogy or pedigree, in this "heavenly society" a reflex of the conditions of the society as it existed upon earth! Upon earth a man had a wife—hence a god had a wife. As human parents had children, so gods could have children. If descent was reckoned among the people through the *father*, it is natural to suppose that this was transferred to the gods also; if on the other hand, descent was reckoned through the *mother*, we must find in the genealogy of the gods also this latter custom. Indeed, we find *both* reckonings. Of the seven *sons of Bau* and *Nin-Mar-ki* the *daughter of Ninā*, descent is reckoned through the *mother*! *Enzu* and *Nin-Girsu* are the *sons of Enlil*; *Ud* is the *son of Enzu*: descent is reckoned through the *father*! The fact that original attributes of *Ninlil* were in course of time *deified* and became separate goddesses—all however being conceived of as wives of *Enlil*—shows that there existed *polygamy*. Also polyandry was practised. *Bau* was the wife of *Enlil*, but she marries every year *Nin-Girsu*, the god of rain—hence *Bau* has or may have two husbands!

Furthermore we know that both *Bau* and her husband *Enlil* were "the first-born of *Anu*"—hence there was a time when the brother did and could marry his sister. At the time, then, when the "divine genealogy" originated all these practices must have been in vogue. But even this is not all. We know from historic inscriptions how new gods came into existence. *Sargon I.*, *Naram-Sin*, *Gudea*, and especially *Dungi* "King of *Ur* and of the four corners of the world" made themselves or were made "gods." Now it happens that just these kings are *Semites*, hence this "*making*" of gods may be called *Semitic* in at least this sense that it was practised by Babylonian Semites *also*! What was the mode of procedure in creating such new gods?

Although we do not as yet know the reason or underlying principle which justified in each case such a step, yet this much we can say:

1. That those kings had *temples* built in their own honor;
2. That they placed their own *statues* in those temples;
3. That certain *sacrifices* were to be *offered* to their statues on certain specified *days*, which sacrifices were presided over by priests created especially for this purpose;

4. That in at least one case a month was called after and dedicated to such a new god (itu Ezen ^{dingir} Dungi);

5. That their names were prefixed by the sign for "god," i. e., he was transferred to the "heavenly" spheres and thus identified either with a certain part of the cosmos (cf. UD, ZU, Innanna), or with a star (Bur-Sin became the "star" AMAR-UD);

6. That new proper names came to be used in which this or these new gods formed an important element (cf. Ur.^{dingir} Dungi).

Taking all these facts into consideration, the process in the creating of such new gods is probably to be conceived of as follows: whenever a king or a patesi thought he had sufficient reason to warrant his becoming a god, he first of all had a statue of himself made, put this statue in a temple, either of another god (Gudea), or in one especially built for the sheltering of his "other self" (Dungi), and commanded that sacrifices be offered to "his double." The statue in this wise acquired with the temple a "place," i. e., KI, or an "abode," i. e., UNUG, upon the earth—hence we have such names as Enlil-KI = place of Enlil; Uru-unug-KI = the abode of Sin (upon) the earth; Innanna-unug-KI = the abode of Ishtar (upon) the earth. The *original* signification of the KI, the "determinative of place," at the end of these words, therefore, was that the "abode" was to be sought upon the "earth," in the *terrestrial* world. A "god," however, does not belong to the *earth only*, but he must have his dwelling-place in the *heavens also*, hence,—as the *heaven* is that which is *above*, and as *above* is expressed by AN, and as such opposed to KI or earth, which is below—it happened that such a god became the sign AN prefixed to his name. The terrestrial Gudea, became a heavenly Gudea, i. e., an AN Gudea, and as such read ^{dingir}Gudea, i. e., ^{god}Gudea. This process of transferring the terrestrial to the heavenly went in course of time so far that even the rivers of Babylonia, the Tigris and the Euphrates, and Babylonian cities¹ were supposed to have their heavenly counterparts, yes, the heavenly became in every respect a reflex of the terrestrial. Therefore, if we want to learn something about the ancient Babylonian world we must look up to the heavens: they *reveal* everything to us. And what they reveal is this:

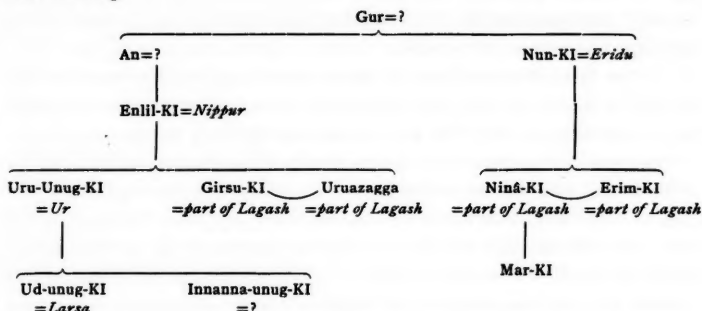
Heaven and earth are *one*. They form the "firmament"; the heaven is the *upper* or AN and the earth is the *lower* or KI part of this firmament. This AN-KI, this "world" is a reflex of the "world" of the early Babylonians. This latter "world" was the valley between the Tigris and the Euphrates—hence Babylonia *must* consist of two parts too, and it does! They are Ki-en-gi-ki-BUR-BUR = Shumer and Akkad, i. e., the *low* and the *high* land!² If there be an AN-Enlil, there also must be an Enlil-KI, if there be an AN-Ud, there also must be an Ud-(unug-)KI, etc. If AN-Enlil was the *father* of AN-Uru(ki) and AN-

¹ E. B. H., p. 161, note 1.

² Cf. here *Upper and Lower Egypt, Israel and Juda, etc.*, etc.

Nin-Girsu it is evident that Enlil-KI must have been the father of Uru-(unug-)KI and Girsu-KI. But Enlil-KI is = Nippur, while Uru-(unug-)KI or Girsu-KI are = Ur or Girsu (Lagash). From this it follows that Nippur was older than Ur and Girsu and that the latter two were thought to be the children of the former, i. e. that they were founded by or were colonies of Nippur.

The genealogy of the oldest gods of Babylonia given in my Creation-Story, p. 61 (= *The Monist*, XII., p. 620), becomes thus a genealogy of the *political development* of Babylonia, which when expressed in the form of a pedigree would be the following:



The abode of AN was probably Ki-an-KI (i. e., the territory of An-KI; *E. B. H.*, p. 134) = (or?) Erech (Unug-KI, i. e., the abode κατ' ἐξοχήν). The city of Gur I would like to identify with Nisin (or possibly also Erech). The fight of Marduk and Tiâmat would thus become a fight between Babylon and Nisin (or Erech). This latter supposition is admirably borne out by the dates of the kings of the first dynasty of Babylon, in which Nisin appears to be the arch-enemy of Babylon.

The pedigree of the political development of Babylonia must again represent a *human* genealogy, for the cities where those different gods were worshipped were not founded by gods, but by *men*. Hence the "god of Nippur" or Enlil must originally have been a *human being* who founded that city and called it "after his own name": Enlil-KI. The "origins, social and religious," from this standpoint would be as follows:

1. Enlil, the son of AN, founded a city and called it "after his own name," Enlil-KI.

2. Enlil the founder of Enlil-KI became thus the *guardian* of Nippur, and in course of time by means of ancestor-worship also the *god* of Nippur. From this resulted the idea that with the founder or guardian or god of a city the city stands or falls—if the god was left in his place, the city retained its independence; if, on the contrary, the god "left the city," i. e., if he was carried away captive, the city ceased to exist.

3. As god he was transferred to the "upper" world; he became an AN-Enlil, i. e., *dingir* Enlil.

4. This transference was applied to all the other founders of Babylonian cities. The founders were members—either brothers and sisters, fathers or sons—of a *human* society. This *human* society by being transferred to the heavens became thus a *divine* society, i. e., the oldest human became the oldest divine *genealogy*.

5. Just as *Babylonia* developed, so, it was thought, the *whole world* developed—hence the "*genealogy*" (originally human, later on divine) became a "*cosmogony*," and as such a reflex of the political development of the "*world*" of the early Babylonians, i. e., of *Babylonia*.

6. The political development of *Babylonia* having been transferred to the heavens can thus be gathered from the heavens again. From this resulted astronomy and astrology, in which the Babylonians were especially famous.

The heavenly or upper world is thus a reflex of the lower or terrestrial world. In the former, then, we can find portrayed the exact conditions—social and religious—as they were at the time when this religious system was in process of formation. The "*genealogy of the gods*" is complete, however, in the earliest inscriptions so far found, i. e., at about 5,000 B. C., at which time already we find Semites in *Babylonia*, who had *adopted* this *religious system*. The Sumerian theogony or cosmogony can, therefore, be called a Semitic theogony and cosmogony, at least in so far as it was adopted and appropriated by them. If, however, it be asked whether this system can be called the reflex of the social and religious life of the Semites *before* they had invaded *Babylonia*, i. e., of the *primitive* Semites when still living in their cradle-land Arabia, we must confess that we *do not know*! Hence it is at the present impossible for us to talk about *Semitic Origins*! We first of all ought to find out something about the *historical* Semites. If we would know something about them—so far it is very little—then let us wait till a primitive Semite speaks to us. As long as we have no documents written by primitive Semites, all we may say on this subject is, at the very best, only guesswork!

In the third chapter Barton discusses "the origin of Semitic religion." As a basis for his discussion he takes the, no doubt, very correct proposition that "the religious conceptions of a people are expressed in forms which are modelled, in large degree, on the political and social institutions" (p. 82). Barton however comes to a conclusion quite different from the one at which we arrived (see above). This is due simply and solely to the fact that he first of all builds up a theory of his own and then tries to force the different gods into this theory. In his attempt at doing this there may be detected on almost every page of his book misstatements, misquotations, grammatical errors, too much trust in other authorities, and superficiality. Criticism, however, must not be negative only but also positive. This commands me to illustrate my assertions. Passing Barton's explanation of the phrase

"to know good and evil," I shall confine myself here to the "transformations" discussed in chapters IV. and V.

Barton's theory is that each and every god of the Semites is or was developed out of a "woman," a "mother-goddess." This mother-goddess, he thinks, was Ishtar, who was a "never failing spring or springs, and that some sacred tree to which the spring gave life represented her son," i. e., Tammuz (p. 86). Ishtar becomes thus a goddess of *fertility*. All the other gods he tries to connect in some way or another with *fertility*, thus making them "women." To these "women" are reckoned among others even Bêl, the old Enlil, and Jahveh! But now *ad rem!* Page 128 we are told that Ilmaqâhu "the divine protector"—thus read and translated by Barton—displaced Athtar. Ilmaqâhu is a protector of children and a giver of fertility—hence an attribute or epithet of Athtar! According to the translation given, Barton sees in אֱלִמָּקָה only two elements, but according to his reading there ought to be three, viz.: אֱל + מָק + ה; מָק he takes as a Piel-form of מָקַר or מָקַר and reads and translates: maqqâ=protector. But this is no grammar. Suppose we had the וּמָקַר, we could only translate "god protects him." Barton ought to have been aware that the Piel-form of מָקַר could only be מָקַר = maqqaja, hence the name ought to have been written אֱלִמָּקַיָה. But it is written אֱלִמָּקָה, hence the root cannot be מָקַר but must be מָקַח. אֱלִמָּקָה therefore can be read only either Almaqûhu (= broken plural) or Almaquhu (= elative). That this latter reading is to be preferred I have shown in my Creation-Story, p. 66, note (= *Monist*, XIII., p. 112). Almaquhu is the god of rain, lightning, etc., and as such a god of fertility, etc.

On page 222, note 6, he wants us to believe that Ashur can be derived from Ishtar according to "grammatical rules," invoking for the assimilation of a "t" to a preceding "sh" such an authority as Delitzsch, *Gram.*, § 51, 2. Delitzsch quotes here the "vulgar Assyrian" forms asakan, asarap, etc., as having arisen out of ashtakan. But this is impossible! ashtakan can become only altakan, *never* asakan! The development of asakan is this: atshakan, atsakan, assakan, asakan, cf., shalatshunu, shalatsunu, shalassunu, shalasunu, quoted by Delitzsch, *Gr.*, § 51, 1. The rule is: the "t" of the "t"-formation is put *before* the first radical in verbs beginning with Š, Ṭ, Ḍ, and Ṣ in Vulgar-Assyrian. Cf. also the forms: tidûku for ditûku, tizkûru for zitkûru, etc., on one hand, and on the other: bishshash=pitshash; eshshu=edshu; shishshu=shidshu, etc. in K. B. VI¹, p. 412. These latter forms might possibly have been invoked by Barton, but *never* the former.

On page 260, note 6, Barton wants to improve upon Jensen (K. B. III¹, p. 54), but utterly fails. The passage is taken from Gudea, Statue F, I, 12-II, 4. Col. I, 1-7 contains the common formula of dedication, so often used in cylinder inscriptions. With l. 8 "galu" begins a relative construction, indicated by the A in the verbal forms. The final verb is contained in II, 4. 5. The whole passage should be read and translated (against Amiaud, Jensen, Thureau-Dangin, Barton) as follows:

8. galu nin-du-e pa-ne-ud-du-A	who executeth that which is becoming,
9. E-ninnû dingir Im-gig-ghu-bar-bar	who the Eninnû, etc.
10. dingir Nin-Gir-su-ka	of Nin-Girsu
11. mu-ru-A	has built
12. dingir Ga-tum-dug	who for G.
13. nin-a-ni	his mistress
14. Shir-pur-la-ki	in Sh.
15. uru ki-ag-ga-ni-ta	her beloved city
16. te-unug SHUZ(!)-za-A	an abode has splendidly erected
II, 1. mu-ni-tu-da-A	he whom she has born :
2. E dingir Ga-tum-dug	the temple of G.
3. nin-a-na	his mistress
4. ru-ne	he built it
5. shà nu ma-shi-tur	and (her) statue he brought into it.

In l. 16 therefore there is not the *slightest* trace of khallabi. For SHUZ = nasáku II¹ see H. W. B., p. 472, and Br. List., No. 3019 = herrlich, prächtig, herrichten. For the NE = "it" in II, 4 see Statue B viii, 49 : Sin, his name, nobody opens it (gab—NE); *ibid.*, IX, 5 : by (!) the gods so and so his fate it may be changed (ghe-dá(!)-kur-NE). Hastiness in Barton's work may be detected :

(1) On p. 205, where B. tells us that we have in iv R 1, col. II, 23-28, the expression AM-A-A dingir EN-LIL and AM-A-A dingir NIN-LIL, i. e., "the mother-father Enlil" and "the mother-father Ninlil." But Enlil and Ninlil are followed here by the postposition GE, hence we have in the Assyrian translation "sha ilu dito." From this it follows that neither Enlil nor Ninlil are an AM-A-A, but dingir EN and dingir NIN are the AM-A-A of Enlil and Ninlil respectively. AM-A-A is simply the Sumerian mode of expressing our word "parent"; cf. Sum. "water of heaven" = rain; "water of the eyes" = tear, to cry, etc.

2. P. 193 and note 3 : Not Nin-Girsu but Ur-Nin-Girsu means husbandman. B. quoted here Br. List. N. 10,995 without verifying the references! See Creation Story, p. 66, note = *Monist*, XIII., p. 112; Del. H. W. B., p. 58; Brünnow, List No. 11,267.

3. P. 207, note 9 : Not gishgalla but im(!)-gishgalla is = shûtu = south.

It would lead me too far to quote all passages belonging to this class, as UD-UD for utu ud-du-ta, p. 182, 2, etc., etc. Barton is not acquainted with the early Babylonian inscriptions, is therefore obliged to put too great a trust in his authorities. On p. 198, on the authority of Jastrow's *Religion of Babylonia and Assyria*, p. 64, he makes the statement that the wife of Ea does not appear in the older literature. If Barton had taken the trouble to look up the references given in E. B. H. *sub* Ninki and Damgalnunna, he would have found several places where the goddess occurs. Jastrow in the German edition of his *Religion* used E. B. H. to better advantage. See Jastrow, *l. c.*, p. 63, 5-6, and comp. E. B. H., p. 81, note 1, and p. 224. If Barton mastered the old Babylonian literature, he

would have been aware that the inscription CTBM, Pt. V, No. 12,061, quoted by him p. 193, note 4, was published also by Winckler in his A. B. K. No. 4 and translated by me in E. B. H., p. 117. By looking up these references B. will find that there is nothing to be found in the inscription about Nin-Girsu's being called a "god of life"! P. 212 B. tells us that Nabu does not appear in extant inscriptions till the time of Khammurabi, but see Scheil, R. T., xix, p. 48, and E. B. H., p. 229. The Canaanites began to invade Babylonia sometime before 3000 B. C. Nabu being a Canaanitish god, it is probable that that inscription may belong to the dynasty of Isin. On page 188, note 9, B. translates an inscription published in CTBM, Pt. V, No. 12,218. B. apparently did not know that this inscription had been published elsewhere and has been translated by Jensen, K. B., III¹, p. 68, ii, and by me in E. B. H., page 37. Or, if B. did know that that inscription had been translated already, and only wanted to improve upon the translations extant, does he really think that the ancient Babylonians would commit to writing such an inscription, where neither the name of the dedicator nor the god to whom the inscription was dedicated are given? The person dedicating is Bau-nin-a-an, i. e., either: "Bau is the mistress of rain" (because she is the wife of the god of rain: Nin-Girsu) or: "Bau is mistress indeed," but *never* "Bau lady of heaven"! The god to whom she dedicates the inscription is Nin-lil (?), her mistress. The translation of this inscription throws a welcome light upon Barton's competency in translating Babylonian inscriptions.

On p. 206, note 1, we have another exhibition of Barton's ability. Here he has left out just the most important thing of the whole sentence: the verb. For a translation cf. E. B. H., p. 76, and p. 81, note 1. In Sumerian a sentence *never* ends with a postposition, but with a verb. The crowning point of Barton's knowledge in reading and translating Sumerian inscriptions is to be found, however, on p. 193, note 1. (= Gudea, Cyl. B. X, 3-8).

For gishtin-a-da read zal-^{sun}-da; da = postposition; sun = CHI + A = collective sign, which is, by the way, not given in Price's List. For gishtin-tin-a-da read kash-^{sun}-da. For uz azag uz ga gu bir-mir read uz-azag uz-ga-nag (! = sucking kids, E. B. H., p. 343, 8) URITSU alim-^{lu} (cf. Cyl. B, viii, 5: URITSU^{lu}-alim-MA!). The determinative lu = 𒌦 = sheep, may stand either at the end or at the beginning of a word, cf. E. B. H., p. 206: kur-gig-^{ghu} and ^{ghu}-kur-gig! For alim = kusariqu see Jensen, K. B. vi¹, p. 311 f., H. W. B., p. 345, and Jensen, Kosm. pass. For uritsu, E. B. H., p. 347, 12. Uritsu^{lu} alim (not identified by Price!) = "young rams"; Barton makes them to be "THE DRINK FROM THE ASSES OF MOTHER NIN-GIRSU"!!! Am^{dingir}Nin-Gir-su-ka can only mean "mother of Nin-Girsu,"—at least according to Grammar, which, however, does not exist for Barton. For E-shi-a-mus read E-ninnu-a-mush. For en imir siba bir-mir read en alim-^{lu} sib URITSU alim-^{lu}. For mi-ni-da mu-na-da dib sum read me-ni-da mu-na-da-dib-e. For the meaning of this latter phrase, "upon his command (Gudea) caused to take," instead of Barton's "he raised, he lifted up, he brought, he presented it,"

see Thureau-Dangin, ZA.XV, 1900, p. 55. A few minor points ought to be mentioned. Barton says, p. 218: "There is no direct evidence in the inscriptions as to whether Nidaba was masculine or feminine." But see Creation Story, p. 27 = *Monist*, XII, p. 594, note 6. Page 213, note 5, we find in Barton's book a translation of a E. A. H. tablet. As the original is not accessible to me, I cannot point out the different misreadings. However, col. III, 3 must be read—as far as I can remember that inscription—Ur-a-pa-azag-a (instead of Barton's lik-a-gar-a). Barton's translation of that inscription I cannot understand. Who can? Page 189, note 7: In Cyl. A, xxiv, 6 we read: ^{dingir}Ba-u zi (life) -shag (heart) -gal (having), i. e., "Bau who has life within her," and not, "chief mistress." How Barton together with Davis quoted on p. 190, note 5, can find in Cyl. A, xxiii, 5: ^{dingir}LAM EN ^{dingir}Nin-gish-zi-da dumu-ka An-na-kam "a Ningishzida brother of Bau," I fail to see. See also Creation Story, p. 17, 12 = *Monist*, XII, 584. To Barton's discussion of the meaning of NIN see my Creation Story, p. 11 ff. (= *Monist*, XII, p. 578). On what authority does Barton claim (p. 188, note 1) for "dam" the meaning "lady"? Where is it said that EN-GIR-ŠI is = NIN-GIR-SU, as Barton, p. 193 wants it? Nin-en (p. 188, note 7) does not mean "supreme lady," but "mistress of the priests," i. e., "high-priestess," Creation Story, p. 25, 8 (= *Monist*, XII, p. 25). Gudea did not place in the temple which he built for Ninā "the image of a lion." Here (p. 188, note 8) Barton misread the mā-magh for ur-magh! For a translation of the inscription see E. B. H., p. 193. Ships were often built in honor of gods: E. B. H., pp. 275, 2; 255, 9 *et passim*.

On p. 182, note, Barton is bold enough to say that my reading of the goddess Ishtar as Innanna is based upon Thureau-Dangin. Of course, but Thureau-Dangin as well as I know that such a reading is justified by Br. Mus. 82-8-16, 1 (= Abel-Winckler, *Keilschrifttexte*, p. 54) l. 18: en-me INNANNA | en-me-e In-na-an-na-ku | e-nu sha ^{lu}Ishtar. See also Jensen, K. B. III¹, p. 20, note 4. Barton apparently never knew that such a reading was possible. In conclusion, a few words about the inscription of Lugaltarsi, of which inscription, Barton, p. 182, note, says that Thureau-Dangin as well as I "have missed the significance of the same." Barton gives a new translation on p. 181. Against that translation is to be said:

1. "King of the countries" is an attribute of Enlil, E. B. H., p. 131, l. 2.
2. This attribute when deified, i. e., when written ^{dingir}Lugal-kur-kur, became a proper name of Enlil, E. B. H., p. 132, l. 14.
3. Its feminine counterpart is nin-kur-kur, and *this only* is used as attribute of Innanna, Creation Story, p. 20, note 11 (= *Monist*, XII, p. 587). Hence "King of the countries" cannot be the attribute of Innanna or Ishtar.
4. On two places ^{dingir}Innanna has the double postposition after it (Creation Story, p. 13, 3, 4 = *Monist*, XII, p. 580), where we therefore *must* translate according to grammar "the goddess of Innanna." Barton ought to have been a little more careful in his assertions.

Many other statements might be brought in, but this will suffice. Barton's

book, no doubt, testifies to great diligence, but his imperfect knowledge of Sumerian grammar and inscriptions would naturally debar him from treating such a difficult subject as the "Semitic Origins."

HUGO RADAU.

CHICAGO, ILL., March 3, 1903.

SCIENTISTS OUT OF PLACE.

[We publish Mr. Paul R. Shipman's criticism of Dr. Alfred Russell Wallace because we feel that his vigorous onslaught hits our own position. To be sure we do not endorse Mr. Wallace's spiritistic tendencies nor his theory of the limits of the universe, but we believe that science and philosophy are so intimately interrelated that every scientist in order to be efficient must be a philosopher and every philosopher ought to be a scientist, or at least ought to be thoroughly familiar with scientific methods and keep abreast of the progress made in the several branches of scientific investigation. In fact our chief aim consists in building up a philosophy of science.—P. C.]

The distinction between science and philosophy, though generally recognised, is not always observed. "Philosophy," it has been said, "is the science of sciences," and the definition is perhaps as good as any other of the terse explanations of this kind of knowledge. Broadly speaking, it is the business of science, in the common acceptance of thinkers, to ascertain and classify facts; while to coördinate and unify the results of science, speaking in like manner, is the business of philosophy. Qualifications for the one, so far from being qualifications for the other, are disqualifications, rather. Science deals with concrete things, and calls especially for observation, experiment, and a mind wide open. Philosophy deals with abstract things, and calls for reason, speculation in the best sense of the word, and a mind not only wide open, but world-wide. Rarely are these two sets of qualifications in a high degree united in the same person. The philosopher who invades the province of the scientist is in danger of leaving it with hypotheses instead of facts. The scientist who invades the province of the philosopher, though he may gratify "the unskilful," is pretty sure to "make the judicious grieve." As a rule, accordingly, it would be well, I think, if scientists kept to their respective departments, and philosophers kept on their Alpine height. *Ne sutor ultra crepidam*. Let the scientist stick to his part. Let the philosopher stick to the whole.

These reflections seem germane to the much-published speculations of Dr. Alfred Russell Wallace on the limits of the universe, which he places at its visible horizon, identifying incredibly the universe of stars with the material universe. Emerging from his special department as a naturalist, he has made an excursion through the visible universe, it appears, and has returned with the twofold conviction that the visible universe constitutes the totality of things, and that it not only was created, but was created peculiarly for "the production and development of man," who is, he says, its "sole and sufficient result." This assuredly is "perilous stuff"—less perilous to him within his bosom than out of it, where, paradoxical as

it is, the "written troubles" of his brain will do him the most harm. The philosopher's fundamental conception is infinity, abstracted from the universe, wherein it is concrete. Imagine a philosopher who turns the constellation of Orion into a mile-stone on a highway to the limits of the infinite—a highway leading out of everything into nothing. Hudibras doggerelises, with an ironical sigh :

"Ay me! what perils do environ
The man that meddles with cold iron."

The twin author of the theory of natural selection probably thinks by this time that these are slight compared to the perils that

do environ
The wight that meddles with Orion.

Already at the mention of his name people the world over are shrugging their shoulders. Astronomers turn their backs upon him. Scientists of all descriptions, including those who might have gone off on the same speculation themselves if they had thought of it, are falling foul of him. Thinkers in every sphere look down on him. Even the level-headed "man in the street" joins in the general concert of veiled contempt. No wonder. As a scientist Dr. Wallace, although not a giant, is of distinguished stature; as a philosopher or speculative thinker, he is a pigmy. Nor in this respect does he stand alone in his class. The same in somewhat less degree may be said of some other distinguished scientists (not to mention the run of undistinguished ones), who ever and anon leap up out of their specialties, like fishes into the air, apparently under the delusion that they can support themselves in the rarer medium above their proper element. Let them in the future take warning from this Icarian flight of the most venerable and not the least accomplished of their number.

In his own department a scientist of this kind is or may be the right man in the right place—a round peg in a round hole. Out of his own department he is a round peg in a square hole. It needs only common sense to perceive that he is out of place.

EDGEWATER PARK, N. J.

PAUL R. SHIPMAN.

BOOK REVIEWS.

AN ESSAY ON LAUGHTER. Its Forms, its Causes, its Development, and its Value.

By James Sully, M. A., LL.D. New York, London, and Bombay: Longmans, Green, and Co. 1902. Pages, xvi, 441.

When we consider that man is the only animal that laughs we must grant that a philosophical discussion of the form, the causes, the development of the value of laughter treats on one of the most serious and most important questions; and the author, Prof. James Sully, one of the leading psychologists, is fully aware of the gravity of his subject. Man has been defined as a tool-making animal, as a speaking animal, a reasoning animal, and a laughing animal. Does that not indicate that the faculty of laughter is of equal dignity with man's rationality, his language, and his industrial ability?

Professor Sully is "ready to challenge the wisdom claimed by the out-and-out sticklers for seriousness," the agelast (ἀγέλαστος), the laughter-hater (μισόγελως). He quotes Pascal without endorsing him, "*Diseur de bon mots, mauvais caractère.*" The friend of laughter (ὁ φιλόγελως) has always existed and, claims our author, "we all shrink from the 'awful imputation' implied in the words 'you have no sense of humor.'"

Professor Sully discusses his subject gravely as behooves a scientist and a scholar. He anticipates the criticism to which he lays himself open for investigating the topic, for to some people all audible laughter is a display of ill-breeding, and Lord Chesterfield congratulated himself that nobody had ever heard him laugh.

The book before us is pretty voluminous, consisting of 432 pages and being divided into twelve chapters. Having called our attention to the fact that a laugh is a bodily act, he warns the reader not to fear allusion "to such unmetaphysical entities as lung and diaphragm," whereupon he proceeds to discuss the nature of the smile and the laugh, which he claims to be identical in all essential details. Tickling is the most common purely bodily cause of provoking laughter, and so a whole chapter is dedicated to its characterisation. We are now prepared to learn something about the physiological basis of laughter concerning which our author says:

"It is conceivable that the disposition to laugh may have its own restricted physiological conditions in a special instability of the mechanism concerned. This again may presumably include some as yet undefinable property of the nerve-centres which favors rapid change in the mode of brain activity, and those sudden collapses of tension which seem to be the immediate physiological antecedent of the motor discharge in laughter."

In the description of the varieties of the laughable (Chapter IV.) and a criticism of the theories of the ludicrous, our author exhibits much learning and sound judgment. Kant and Schopenhauer offer sufficient material and there is no gain-saying Professor Sully's condemnation of their stilted explanations:

"The impressions of the laughable cannot be reduced to one or two principles. Our laughter at things is of various tones. It gathers up into itself a number of primitive tendencies; it represents the products of widely removed stages of intellectual and moral evolution."

And now Professor Sully proposes his own views and sets forth a summary of his own work:

"It will at once be evident that a large investigation into the origin and development of the laughing impulse will take us beyond the limits of pure psychology. We shall have to consider how the impulse grew up in the evolution of the race; and this will force us to adopt the biological point of view, and ask how this special group of movements came to be selected and fixed among the characters of our species. On the other hand, laughter is more than a physiological and psychological phenomenon. As hinted above, it has a social significance, and we shall find that the higher stages of its evolution can only be adequately dealt with in their connection with the movement of social progress.

— "Lastly, it will be by tracing the evolution of laughter in the human community that we shall best approach the problem of the ideal which should regulate this somewhat unruly impulse of man. Such a study would seem to promise us a disclosure of tendencies by which laughter has been lifted and refined in the past, and by the light of which it may consciously direct itself in the future."

Professor Sully is an evolutionist and so he goes back to the brute to explain the human, and seeking in the lower animals that function which would correspond to the smile of man, discovers it in the display of a lively satisfaction in general. He argues as follows:

"We cannot accept common modes of interpreting the 'mischievous' performances of animals. Many of a monkey's tricks are 'funny' enough; yet we may seriously doubt whether he enjoys them as practical jokes. His solemn mien certainly does not suggest it; but then it may be said that human jokers have a way of keeping up an appearance of gravity. A consideration of greater weight is that what looks to us much like a merry joke may be a display of the *teasing* instinct, when this goes beyond the playful limit, and aims at real annoyance or mischief. The remark probably applies to some of the well-known stories of 'animal

humor,' for example, that of Charles Dickens about the raven. This bird, it may be remembered, had to share the garden with a captive eagle. Having carefully measured the length of this formidable creature's chain, he turned to good account the occasion of the giant's sleep by stealing his dinner; and then, the rightful owner having presumably woke up, made an impudent display of eating the same just safely outside the eagle's 'sphere of influence.' This doubtless showed some cunning, and something of spite; but it is not clear that it indicated an enjoyment of the fun of the thing.

"That this teasing and playing of tricks by animals may now and again approach the human attitude of malicious mirthfulness is not improbable. A cat that 'plays' with its captive mouse, half-pretending, as it seems, not to see the small thing's hopeless attempt to 'bolt,' may, perhaps, be enjoying something of the exultant chuckle of a human victor.

"Yet, while we may question the truth of the proposition that these mischievous actions are enjoyed as practical jokes—in the way in which Uncle Remus represents them—we need not hesitate to attribute to animals a simple form of the child's sense of fun. This trait appears most plainly in the pastimes of the young of many familiar species, including our two domestic pets, pastimes which are quite correctly described as animal play.

"Darwin has rightly recognised a germ of our 'sense of humor' in a dog's joining in the game of stick-throwing. You throw a bit of stick for him to fetch, and having picked it up he proceeds to carry it away some distance and to squat down with it on the ground just before him. You then come quite close as if to take the stick from him, on which he seizes it and bears it off exultingly, repeating the little make-believe with evident enjoyment.

"I have tested a dog again and again when playing with him in this fashion, and have satisfied myself that he is in the play-mood, and knows perfectly well that you are too; so that if you pretend to be serious and to command him in your most magisterial voice to give up the stick he sidles up with a hollow show of obedience which could impose on nobody, as if to say, 'I know better: you are not really serious; so I am going on with the game.'

"G. J. Romanes relates that he had a dog who went some way towards qualifying himself for the office of clown. This animal would perform a number of self-taught tricks which were clearly intended to excite laughter. 'For instance, while lying on his side and violently grinning, he would hold one leg in his mouth.' Under these circumstances 'nothing pleased him so much as having his joke duly appreciated, while, if no notice was taken of him, he would become sulky.'

"The anthropoid apes appear both to produce a kind of smile or grin, and to utter sounds analogous to our laughter. It may, however, be contended that this so-called laughter is much less like our laughter than the grin is like our smile."

That laughter is inherited and not due to imitation is shown by the case of "Laura Bridgman, who was shut out by her blindness and deafness from the lead

of companions. She developed these expressions. We must conclude, then, that they are inherited tendencies."

Professor Sully claims priority for the smile; he says:

"It is fairly certain that laughing comes after smiling.

"The first laughter is, like the smile, an expression of pleasure. As Preyer puts it, the laughter is a mere heightening of the look of pleasure. It marks, however, a higher level of agreeable consciousness."

"In the absence of better evidence, the fact that the smile appears first in the life of the child must, according to a well-known law of evolution, be taken as favoring the hypothesis that man's remote ancestors learned to smile before they could rise to the achievement of the laugh. This is further supported by the fact that, in the case of the individual, the laugh when it occurs announces a higher form of pleasurable consciousness, the level of perception as distinguished from the level of sensation which is expressed by the first smile. Lastly, I am informed that among imbeciles the smile persists lower down in the scale of degeneration than the laugh."

The origin of laughter according to Professor Sully would be as follows:

"A baby after a good meal will, I believe, go on performing something resembling sucking movements. The first smiles may have arisen as a special modification of these movements when there was a particularly lively feeling of organic contentment or well-being. I believe, further, that an infant is apt to carry out movements of the mouth when food is shown to it. A similar tendency seems to be illustrated by the behavior of a monkey which, when a choice delicacy was given it at meal-time, slightly raised the corners of the mouth, the movement partaking of the nature of 'an incipient smile.' Again, our hypothesis finds some support in the fact that, according to Preyer and others, the first smiles of infants were noticed during a happy condition of repletion after a good meal.

"Supposing the smile in its origin to have thus been organically connected with the pleasurable experience of sated appetite, we can easily see how it might get generalised into a common sign of pleasure."

It is perhaps difficult to understand how the lungs and diaphragm can become connected with a smile and how tickling can be the most primitive bodily cause of it, but Professor Sully is ready to produce instances from the animal world; he says:

"A young chimpanzee when tickled for some time under the armpits would roll over on his back showing all his teeth and accompanying the simian grin by defensive movements, just as a child does. A young orang at the Zoölogical Gardens (London) behaved in a very similar way. The young of other animals, too, betray some degree of ticklishness."

At any rate "laughter which accompanies tickling and other closely allied forms of play in children owes its value to its being an admirable way of announcing the friendly playful mood."

But what is tickling? Professor Sully answers.

"Children only laugh in response to tickling when they are in a pleasurable state of mind," and this "seems to confirm the hypothesis that the love of fun, which is at the bottom of tickling and makes it perhaps the earliest clear instance of mirthful play with its element of make-believe, first emerged gradually out of a more general feeling of gladness."

These arguments contain the most original part of the author's contributions to the philosophy of laughter; the rest of the book is devoted to a series of topics which are applications of the author's theory and contain many interesting points; Chapter VII., "On the Development of Laughter During the First Three Years of Life"; Chapter VIII., "The Laughter of Savages"; Chapter IX., "Laughter in Social Evolution"; Chapter X., "Laughter of the Individual: Humor"; Chapter XI., "The Laughable in Art: Comedy"; Chapter XII., "Ultimate Value and Imitations of Laughter." Professor Sully concludes his volume with an expression of fear that laughter might die out (we must consider that the book was written in England at the time and soon after the close of the Boer war), but he puts his trust in the growing volume of what he called "private laughter."

"It is not unlikely that in the future, men who think will grow at once more tenacious of their ideals, and more alive to the ludicrous consequences which these introduce.... If a few men will cultivate their own laughter in this way and do their best to make their private amusement that of an inner circle of friends, we may hope that it will not die—though the death of what we love were less terrible to face than its debasement—but be preserved by a few faithful hands for a happier age. They will have their reward in advance, since pure and honest laughter, like mercy, blesses him that gives, and him that takes."

Is it necessary to add, that with all deference to the serious spirit of our author we do not feel satisfied with his explanations of laughter, fun, and humor. His essay is learned and commands our respect, but having devoted a careful study to his theory we can only repeat what Lotze said of Kant's doctrine of the ludicrous (quoted by Sully, p. 18), that he did not exactly understand why a funny idea should make us *laugh* rather than let us say cough, or sigh, or sneeze. We grant that the sucking movements of lips are made by babies as well as the lower animals when no longer really sucking and that they are accompanied by psychological states that are pleasurable, but they are not the germs from which laughter originates. The pouting of the lips can be observed in infants and children when they are intensely interested, intellectual tasting and testing is accompanied by the physiological symptoms of a material tasting and testing, but pouting never changes into laughing or smiling.

Do not our psychologists and philosophers seek far-fetched explanations for a phenomenon which is easily understood if we only analyse its physiological function and keep clearly in mind the psychical accompaniment? Is not laughing (as set forth in *The Monist*, Jan., 1898, Vol. VIII., No. 2, p. 261) simply a reiterated

shout of triumph? Laughing consists in quickly-repeated ejaculations, it is a heightening of man's activity in expressing his sentiments, a rapid breathing accompanied with vocal sounds, the very reverse to moaning which is a depression of the same condition. Moaning retards breathing and interferes generally with the respiratory organs. While it is true that smiling precedes laughing in the baby, we can see in a smile only the indication of a laugh, a kind of sublimated or spiritualised cackination. Tickling as a provocative of laughter is decidedly of a sensuous nature, indicating as it were the good-natured submission of the conquered one by the successful aggressor, both in combat and in love. This becomes apparent from many of the instances that Professor Sully adduces, especially also when a lady on referring to her childhood and speaking of the enjoyment of "this distinctly agreeable sensation of tickling," remarked that there was in it "a vague suspicion that the pastime was not quite proper." He further calls attention to the fact that is not unusual "of a child's refusal to be tickled by a stranger," and "tickling a child unexpectedly and from an unseen quarter will not provoke laughter."

While we do not agree with Professor Sully's theory of laughter, we confess that the perusal of his book was a genuine pleasure and the details of his discussion are both instructive and entertaining.

P. C.

WHY THE MIND HAS A BODY. By *C. A. Strong*, Professor of Psychology in Columbia University. New York: The Macmillan Co.; London: Macmillan & Co., Ltd. 1903. Pages, x, 355.

GEIST UND KÖRPER, SEELE UND LEIB. Von *Ludwig Busse*, Professor der Philosophie an der Universität Königsberg. Leipzig: Verlag der Dürr'schen Buchhandlung. 1903. Pages, iv, 488. Preis, M. 8.50.

The title of Prof. C. A. Strong's book is somewhat misleading, for it seems to indicate that the author follows some Oriental doctrine of pure spirituality called 'mind,' which is materialised or incarnated by assuming the bodily form of flesh and blood. Mr. Strong is no Vedantist, nor a believer in Mahatmans, but professor of psychology in Columbia University, and the work before us is a purely scientific investigation of the main problem of psychophysics, the relation between the states of consciousness and the functions of the brain.

Professor Strong says: "There are thus three distinct theories as to causal relations between mind and body: interactionism, asserting that the causal influence runs in both directions,—in sensation from the body to the mind, in volition from the mind to the body; automatism, maintaining that it runs in one direction only,—always from the body to the mind; and parallelism, denying all causal influence and holding the relation to be of a different nature." He adds: "From causal theories we must distinguish sharply the 'double aspect theory,' with its assertion of one reality manifesting itself under two diverse forms." This last theory presupposes the theory of panpsychism and apparently appeals to the author as best of all. Says he in the Preface: "That the panpsychist explanation is

clear to the bottom and altogether free from difficulties, I should be the last to pretend. But it rests on sound metaphysical principles; it enables us, as no other hypothesis does, to construe the facts; and its difficulties are of the nature of obscurities, not of contradictions.... It enables us to settle the controversy between the interactionists and the parallelists in a way satisfactory to both parties."

The correlation between mental and cerebral functions is stated to be complete. "If there are mental functions which coffee does not stimulate or alcohol benumb, which remain unaffected by fasting and insomnia, they may be admitted to be without physical correlate. But since it is precisely the highest functions which these influences affect, this proves that what is higher, instead of being without correlate, is simply correlated with more refined mechanism. Indeed, if these functions were without physical correlate, why should they be brought to a standstill by the administration of chloroform? Why should not a person under chloroform still continue to judge, to feel pleasure and pain, and to attend? If, on the other hand, chloroform abolishes not merely sensations and images but the 'higher' states as well, does not this prove that all states without exception are physically conditioned?"

Prof. Strong will find that he is not just toward the founders of the theory of parallelism, for closely considered, it is identical with the double aspect theory. We only call his attention to Fechner's well-known simile in which the two series of mental and bodily functions are compared to the inside and outside curvature of a curve.

As to the several meanings in which the term soul is used, Professor Strong says:

"The metaphysical entity called a 'Soul' must not be confused with the 'soul' to which poets and religious teachers refer, nor yet with the 'soul' of empirical psychology and ordinary speech. If we understand by the word, as the Germans do, simply the mind or consciousness however construed, the soul in this sense is a fact, not the doubtful object of a theory. The soul, again, which is a man's most precious possession and whose loss is not to be outweighed by gain of the whole world, is not a man's mental substance but his better self. Even the soul as the subject of immortality is rather a man's consciousness than the mind-atom whose natural indestructibility is supposed to guarantee its continuance. Damnation of the mind-atom without damnation of the consciousness would be a very painless form of retribution, while eternity of the consciousness without eternity of the mind-atom should satisfy the most self-conservative.

"If theologians nevertheless cling to a Soul, it is partly because they deem it necessary to responsibility....

"Again, the Soul is needed as a storehouse for the memories and ideas when not actually in consciousness....

"Finally, to the eye of psychological analysis the thoughts and feelings may appear a bundle, and the mind to share in the mutability and transitoriness of its

states till these are given in charge of an underlying entity. Thus arises the theory that consciousness is a mere stream of phenomena; an activity, not an existence; the manifestation or efflux of a Soul."

In the present book our author is "solely concerned to disprove suppositious entities or principles, and thereby vindicate reality for consciousness itself. But," adds our author, "as I have discussed the matter negatively, I may be permitted to say a word about the positive side of the question...."

"The alternative is *not* either to identify the Ego with objects of consciousness or to make it unknowable, but there is a third intermediate course: to make it experienced but not known. The key to the puzzle lies in the distinction between knowledge and experience. The Ego is the fresh experience as it comes, before we have had time to turn round upon it cognitively, and while we—that is, it—are engaged in cognising other things. Hence, on the one hand, the eternal behind-handedness of cognition, and, on the other, the possibility at the next moment of knowing this knower in memory. This is the solution of the puzzle about the Ego, and no other solution is thinkable."

The gap between the thinking subject and objective reality (he calls the latter things-in-themselves¹) makes Professor Strong pause, but he bridges it, not by proofs, but by arguments *ad hominem*. He says: "Material objects, being immediately intuited, therefore exist as mental states. If there are realities outside the mind, they can be known only through the medium of our mental states, that is, representatively. Phenomenalism, or the denial of such realities, is a perfectly logical theory of perception; the fact that it makes objects cease to exist when we cease to perceive them being no valid argument against it. But it gives us a mutilated and incoherent conception of the universe, and it leads logically to solipsism. To restore unity to the world, to fill out the causal order, to explain the evolution of minds, we must assume things-in-themselves."

Professor Strong offers the following theory as plausible: "Consciousness may itself be the reality that appears as the brain-process. This hypothesis would admit consciousness to a place in the causal order and guarantee its efficiency as surely as the other." Yet it "alone explains the connection of mind and body and the origin of mind. This hypothesis alone, by conceiving the relation between consciousness and other things-in-themselves as the counterpart of that between the brain-process and the rest of the physical world, admits consciousness to a place in the causal order without making it a form of energy. This hypothesis alone, by making the physical world disappear, so to speak, in the individual minds, offers us a monism of stuff as well as of form."

Our author is never dogmatic and so purposely uses the word "may." He finds difficulties in his solution which, though not insuperable, "may be sufficiently

¹ We doubt the propriety of using the term "things-in-themselves" in the sense of objective reality. But the author's meaning is clear, and that is sufficient.

serious to prevent impartial readers from accepting the theory." To deal with the psychological problem properly, "it would be necessary to take, one after another, such forms of consciousness as memory, discrimination, perception, will, to analyse it, and to ask wherein its unity consists. All the difficulty is on the score of the unity."

Professor Busse treats the same subject but from a different standpoint, perhaps more ponderously and more thoroughly, after the fashion of a German professor. There is less hesitation in his methods, and he is very vigorous in his refutation and condemnation of adverse opinions.

Professor Busse compares the contents of his book to a *menu*, and offers as an *entré* the refutation of materialism.

Having reviewed in the introduction all possible standpoints: the materialistic-idealistic spiritualism, dualism, and parallelistic monism, he takes up with special delight the task of utterly overthrowing materialism.

There are three types of materialism in psychology: (1) The psychical is regarded as matter, or as a state or property of matter; (2) The psychical is regarded as a product of bodily functions; and (3) it is regarded as an accompaniment of physical conditions. Materialists, however, are not so clear in their distinctions as is our author. The three types are as a rule fused, and they themselves do not clearly know to which theory they owe allegiance. The refutation of materialism is done with a firm hand. Professor Busse asks us to consider what matter really is, and the answer is crushing. Matter is simply the contents of consciousness; it is nothing but a phenomenon given in consciousness. Accordingly, it presupposes consciousness. Ergo, consciousness cannot be either matter itself or the product of matter. In the same way, all other forms of materialism are successfully overcome. The psychical and the physical are so heterogeneous that consciousness cannot be a function or a product of matter. Their heterogeneity excludes any relation of cause and effect. If, however, the materialist regards consciousness as an accompaniment, he is no longer a materialist, but trespasses on the ground of the theory next to be considered, viz., the doctrine of parallelism. Obviously, the materialistic aberration is the most curious of all, for, says Lotze, "Nothing can be stranger for spirit than to doubt its own being, or to regard itself as the product of some external nature of which we know only second-hand."

Having digested the *entré*, we have now served the more substantial food of the *menu*, a discussion of the theory of parallelism. Their representatives are antagonists deemed more worthy of our author's steel. There is an empiric and a metaphysic parallelism, but neither of them can stand the close scrutiny of Professor Busse's critique. There is further a partial and a universal parallelism, a materialistic, a realistic-monistic, and a dualistic parallelism. Our author grants that the theory of parallelism possesses some advantages. It promises to satisfy the demands of the materialistic explanation of nature, and it remains in accord with principles that regard the whole nature as one consistent system of causation, sub-

ject to the law of the conservation of matter and energy. But in spite of it, the theory of parallelism is untenable; it is practically neo-Spinozism. In spite of the attempt to become monistic, it is practically a concealed dualism, or at least a combination of monism with dualism. Accordingly, it is inconsistent, and must be rejected. The idealistic-monistic theory of parallelism is superior; yet even in this higher form it cannot satisfy the demands of the critic, for in spite of its several advantages a psychical remainder is left to which we cannot assign a physical counterpart. This, of course, contradicts the demand of a thorough parallelism of the two series, and necessitates a new solution which he finds in his own doctrine, called *Wechselwirkungstheorie*, which means the theory of a reciprocal causal relation between spirit and matter.

This theory of a reciprocal causal relation satisfies all demands, and here Professor Busse rests his case. It is a return to the old position commonly regarded as surrendered long ago; but it is more natural and is not open to the criticism of artificiality, which is the fault of the theory of parallelism.

For a detailed justification of Professor Busse's theory in contrast to the many and various representatives of the parallelistic theory, we must refer our readers to the author's own explanations (pages 380-474). It ought to be regarded as the most important part of the entire volume, but it would lead us too far here to offer an exposition of his arguments. We can only say that our author weighs all objections in the balances of probability and none of them is deemed weighty enough to be regarded serious. Accordingly it is admitted as the only acceptable theory.

We have now only to turn to the desert of our *menu*, which consists of the *Weltbild*, or the entire world-picture, from which the *Wechselwirkungstheorie* has been sliced off. The physical world appears to be left to its own laws. It need not be interfered with. "Only when the development of a group of cells assumes definite forms, the psychic element appears; it does not come as a property or a product of matter or the forces of matter, nor as a summation or interpretation of atoms, nor as their inner aspect; it comes as something quite new; it is conditioned by the formation of this world of bodies, but it cannot be explained from it. For a physico-empiric consideration, it originates from nothing. . . . That may be called a miracle, but one should consider, as says Stumpf, "that a miracle regularly repeated under definite conditions ceases to be a miracle and belongs to the category of natural laws." Whenever and wherever the conditions for the appearance of a higher psychic nature are given, there it appears, not as the product of a pre-existent spiritual stuff, nor by transformation or evolution, but by being added to it as something new demanded by the meaning of the whole, and as the fulfilment of definite conditions of spiritual existence." This is taken to prove that man has not risen from the anthropoid apes, but is an independent creation that appears in this world as something new. All new formations are qualitatively and specifically differentiated; nor can the human spirit, being spontaneity, be resolved into a psychic mechanism. A mental mechanism exists, but it is only one feature

of our spirit; man's mental mechanism is a tool, of which his spirit makes use as a means to an end.

In Professor Busse's world-picture, which he calls the idealistic-spiritualistic world-conception, the corporeal world disappears as such and becomes mere phenomenon; it is replaced by something spiritual. Here begins the province of the idealistic-spiritualistic metaphysics, and Professor Busse leaves the question open whether its problems will find their best solution in a monadological or in objective-idealistic metaphysics. Either has its advantages, and the two agree in all the main points, especially in this, that on their premises we can plainly understand how spirit exercises its effects on body, and *vice versa* how the body reacts upon the spirit. This is the most significant result of Professor Busse's painstaking investigation.

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PURE SOCIOLOGY. A Treatise on the Origin and Spontaneous Development of Society. By *Lester F. Ward*. New York: The Macmillan Company. 1903. Pages, xii, 607. Price, \$4.00.

Dr. Ward's *Pure Sociology* offers students of this science the first real "system" in any comprehensive sense, that has yet been written. Sociology, the author notes, is still in the analytic stage. The majority of students are still concerned with special inquiries, which taken singly lack perspective, and taken together lack a common basis of valuation or purpose. *Pure Sociology* does effective service in giving to this field a much needed synthetic scheme of social data. Beyond this, the work is a theory of social life, creative and convincing, such as could only have been conceived by a man of great genius and originality.

The author's point of view is strictly evolutionary. On the basis of an historical scrutiny of the course of events, he reaches a theory of the social order as exemplified in the civilised countries of to-day. He makes the subject-matter of sociology "Human Achievement," and sets out with a search for those remoter roots of life from which our complex social processes have grown. He finds the principles which underlie social phenomena the same in essence as those in organic, or even in inorganic, nature. Psychic phenomena are as determinate and predictable as chemical phenomena, when once their nature and relations are known. Hence sociology is a true science, capable of exact treatment; but a scientifically competent knowledge of present-day facts and observances requires a broad sweep back into the sciences from which it is derived.

Dr. Ward's large information in these underlying domains, and his capacity for co-ordination of data, is well seen in the section on "Genesis"—the "Origin and Spontaneous Development of Society." Broad principles are enunciated, such as to contribute substantially to the theory of evolution at large, at the same time that they suggest a monistic explanation of social facts. Among these laws that are to be placed to the credit of Dr. Ward is the theory of "Sympodial Development," which conceives the sequence of evolution as a "sympodial" growth, rather

than as a tapering "tree of life"—currently accepted as a satisfactory representation of the cosmic "becoming." Its advance is a zigzag course, marked by a series of culminating points, whose direction is changed on the appearance of each successive product of development. The factors in this rhythmic march are the same as those found in the growth of sympodial plants—overspecialisation followed by decline and the carrying over and survival of larger vital elements in the derivative stem or offshoot. "Degeneration" thus becomes nothing more than the atrophy of forms absorbed and recreated under new conditions. The sociologist, paralleling the history of organic life, explains the rise and decline of races by this "law of the persistence of the unspecialised." He explains the catastrophic progress of civilisation and its Westward march as a course of successive branchings of social life. The failing peoples do not in reality degenerate, but are merely subordinated to more vigorous types, which are true "anthropologic sympodes," better adapted to survive.

The "filiation," or genetic relation of the sciences suggested above is carried over to the processes of nature and completed by the theory of "Creative Synthesis." This is perhaps the most important single principle enunciated by Dr. Ward. As the name implies, the process of evolution is not simply a sequence of derivation; there is a progressive individual distinction of the resulting products with each successive recombining of the elements involved. The fact that genesis is in this way a "creative" process not only permits an infinite variety of forms to spring from relatively few elements, or even from an assumed "unitary substratum" of the universe; but it reinforces the essential kinship of social phenomena to the less highly differentiated products of the lower levels of evolution. Dr. Ward makes an interesting application of these laws to the "synthetic creations" that emerge on the psychical stage; as, for instance, "social ideals," which spring from the creative imagination. The "poetic idea" is defined as a "homogeneous undifferentiated truth," a sort of "prophetic type" which embodies the rudiments of many correlated truths that are ultimately brought out in distinct form as individual propositions which mutually reinforce one another. And the "collective mind," or social consciousness becomes under this terminology the "spontaneous creative synthesis" of all individual minds.

The philosophical monism which pervades the thought has a far-reaching effect. It welds the "telic" activities of mankind to the most rudimentary links in the chain of the processes of nature. It posits the biological origin of mind and makes consciousness a property of matter. Mind is a "differential attribute" of the vital processes evolved under the law of creative synthesis, worked out through interaction of less complex elements. This "primordial psychism," in the form of "feeling," first arises as an expedient to the furtherance of the organic functions; but it presently grows into the self-conscious "will" of associated man, and so becomes the fundamental social force. The sequence of synthetic processes, as it is described by Dr. Ward, involves an unremitting conflict between "feeling" and

"function"; yet nowhere does his exposition part from the standpoint of monism with which he sets out. His monism is avowedly loose and broad; it aims to reconcile "infinite diversity with perfect unity," and protests against the narrowness and mysticism into which the great principle has sometimes been compressed and perverted. Within the scope of this ultimate unity, and conditioned by it, there runs throughout the cosmos an all-pervading dualism, a "universal polarity." It is from the equilibration of antithetical forces that eventual organisation comes. This constructive process of equilibration between contending forces Dr. Ward has felicitously named "Synergy." Like the other two laws of evolution advanced by him, this law of synergy applies also to the whole range of the diversified phenomena of life. Indeed, he makes it apply to all constructive change, from cosmic and chemical rearrangement to the spiritual and institutional creations of man. The law of synergy is made to account for the established order of society and to explain the characteristics of all human institutions, religious, domestic, civil, political, and the rest.

The section on Genesis alone affords many further examples of the author's creative insight, but these can neither be detailed nor summarised here. On the other hand, a minor, perhaps superficial, criticism may be in place. It is a matter for regret that the author should have allowed himself so free a use of received teleological phrases and turns of expression in his exposition of genetic sequence. In apology he explains that since the language has taken form under the guidance of teleological habits of thought, the teleological forms of speech are unavoidable, that while of necessity he employs these locutions, he allows them to mean nothing more than the "tendencies of things." But, warning and reservation notwithstanding, recurring expressions concerning the "object" and "end" of nature have their due effect, and are sufficiently disconcerting to any student who is struggling to get away from ingrained teleological prepossessions. It might fairly have been expected that a writer who has shown himself so great a master in the profounder reaches of creative invention and so ingenious an adept in terminological expedients at other points should have found his way to a simpler, more consistent and sincere terminology in this matter that touches the foundation of scientific inquiry.

LAURA MCADOO-TRIGGS.

ZUR EINFÜHRUNG IN DIE PHILOSOPHIE DER GEGENWART. Acht Vorträge von Alois Riehl. Leipzig: Verlag von B. G. Teubner. 1903. Pages, 258.

Alois Riehl, at present professor of philosophy in the University of Vienna, and one of the most ingenious coryphæi of German thought, has collected a synopsis of his philosophical views into what might be considered an introduction to philosophy in the form of a series of eight lectures: I. On the Nature and Development of Philosophy; Philosophy in Antiquity. II. The Philosophy of Modern Times; Its Relation to the Exact Sciences. III. Critical Philosophy. IV. The Foundations of Cognition. V. Naturalistic and Philosophical Monism. VI. The

Problem of Life. VII. Schopenhauer and Nietzsche; The Question of Pessimism. VIII. The Present and Future of Philosophy.

Professor Riehl's diction is elegant, and occasionally he carries away his readers with the rhetorical beauty of his sentences, while the thoughts themselves are mature and sound. At the same time he is considerate and shows his appreciation of abnormal phenomena in our philosophical development, especially in his treatment of Schopenhauer and Nietzsche. He by no means endorses the philosopher of the Overman; he is not a follower of Nietzsche, and yet, unlike Nietzsche's antagonists, while pointing out his mistakes delineates his character in a very sympathetic way. He helps us to understand Nietzsche as a phenomenon in the philosophical literature of modern times.

Nietzsche must be understood in contrast to Schopenhauer, for the keynote of Nietzsche's philosophy is the conquest of pessimism. Schopenhauer's pessimism is at bottom hedonistic, a pessimism that despairs of the possibility of enjoyment and must therefore be assumed to be hankering after pleasure. Nietzsche, however, calls out: "The discipline of suffering, of the great suffering, ye know not. This discipline alone has begotten everything that elevates man. Indeed, the standard of valuation consists in how deeply one may suffer."

Nietzsche misunderstood Christianity because he judged it through the conception of Schopenhauer, who interprets it as well as Buddhism as mere negation of life, a negation made for the sake of negation. He knew only the morality of sympathy (*Mitleid*), and did not know that the morality of the Master (*Herrenmoral*) was found before he discovered it. It is easy enough, says Riehl, speaking of Nietzsche's critics, to point out contradictions, and the pathological nature of his philosophy. Further, it is easy to object to Nietzsche's offensive language; but we ought to learn that there are healthy and wholesome elements in Nietzsche's philosophy. We must never lose sight of his intentions and the whole ideal of his mission. The key to his philosophy is contained in the words: "Do not follow me, but follow thyself, thyself alone. Thou must become ever and again he that thou art, the teacher and former of thine own self." Nietzsche felt offended at negativism, and his philosophy aims at the conquest of pessimism. "He condenses," says Riehl, "the spirit of modern times, and by giving it completion he has actually overcome it."

In the same spirit Riehl discusses the epistemological problems and also the questions of natural philosophy, involving the contradictions of materialism and mechanicalism, which have led partly to the theories of energetics as a philosophical principle and partly to the *ignorabimus* of Du Bois Reymond. His own view of philosophy keeps in mind the unity of thought, and while he shows that in classical antiquity philosophy was identical with science, that in the eighteenth century down to our own day philosophy was contrasted with the sciences, yet the future leads back to a unitary conception. "The final result will be that the sciences themselves will be raised to philosophy. Having taken their origin in philosophy,

which was their natural and aboriginal unity, and being differentiated by a division of labor, we shall see them reunited on a higher plane of thought" (page 248).

P. C.

LOGIK DER REINEN ERKENNTNISS. Von *Hermann Cohen*, Professor an der Universität Marburg. Berlin: Bruno Cassirer. 1902. Pages, xvii, 520.

Hermann Cohen is an original thinker, and it is not easy to understand the drift of his argument unless the reader be familiar with the author's previous publications, especially concerning the conception of infinitude. The present volume constitutes the first part of a series which purports to become an entire system of Cohen's philosophy.

In a certain sense Cohen stands aloof from his colleagues. Assuredly he is not at home in modern Germany with its realistic politics and imperialistic ambitions. He mentions with disapprobation the present conditions which are all but unfavorable to a philosophy of ideal aspirations. In spite of this our author clings to his optimism and feels himself at one with the leading thinkers of the past as well as the future. His belief in the final victory of a broad humanitarianism with its ideals of right and justice remains unshaken.

The present volume is entitled *Logic of Pure Cognition*, but it implies the foundation of philosophy. Logic to Cohen is not mere dialectics or a subjective method to be based upon empirical facts or psychological dispositions. Logic is the root of all thought, the objective standard of truth, and the condition of all cognition (pp. 512-513). Philosophy begins with the systematisation of thought, and who can have system without logic! Accordingly, modern associationalism is insufficient (p. 21) and necessarily leads to agnosticism (pp. 514-515), or, what is worse, to a limitation of logic to the subjective sphere of thought, as mere rules of thinking, which would render it possible to re-establish the mediæval principle of two truths. Thus our author takes the ground that there is no metaphysics without logic (p. 517), which leads him further to trace in logic the basis of ethics, æsthetics and psychology. The soul does not establish its nature and the conditions of its being, but discovers them. The data to be found existed before they were established.

It is natural that our author must square himself with the conditions of existence, the prius, or, as Aristotle calls it, τὸ πρότερον τῇ φύσει, or πρότερον ἀπλως (p. 28). Thus Cohen goes in search of the antecedent of being, the *Vor-Sein*, and this feature of his philosophy is perhaps the most difficult part, for he discovers it in the infinite, a non-material condition of reality which suggests the question as to the origin (*Ursprung*).

We appreciate Professor Cohen's earnestness, we agree with his endeavor to establish the objective validity of truth and right, but we are not sure of having understood his meaning as to the repeated proposition of the problem of origin, which occurs in several phases, e. g., as the logic of the origin (pp. 28-34), the

judgment of the origin (pp. 65-77), the thought-law (*Denkgesetz*) of the origin (pp. 103-104), etc. If our author means by origin the eternal formal laws which determine the nature of all being, we do not hesitate to assent to his propositions and will be glad to have our anticipations verified in the subsequent volumes of Cohen's philosophy. At present we confess that his terminology and its application to scientific speculations is not without difficulties, not to say obscurities. Certainly, "origin," i. e., *Ursprung*, should not be understood in the sense of "beginning" (*Anfang*), as our author expressly warns us (p. 65), but in the sense of the Greek term ἀρχή.

Whether or not we will eventually assent to Cohen's views, we must confess that his expositions are thoughtful and suggestive. We have to deal with a genuine philosopher, a man deeply versed both in ancient philosophy and modern speculations, who makes the former bear upon the latter and throws much light upon several problems which are much more ancient than its discoverers imagine them to be;¹ and thus the reader will be richly repaid by a perusal of this *Logic of Pure Cognition*.

P. C.

UEBER DIE BEDEUTUNG DES DARWIN'SCHEN SELECTIONSPRINCIPS UND PROBLEME DER ARTBILDUNG. By Prof. Dr. Ludwig Plate, Privatdocent an der Universität Berlin. Zweite, vermehrte Auflage, mit zwei Figuren im Text. Leipzig: Verlag von Wilhelm Engelmann. 1903. Pages, iv, 247.

It is now forty-four years since Darwin's epoch-making work on the *Origin of Species* appeared. Not only did it cause a fermentation in the scientific world but also modified our religious views considerably. Since the principle of evolution came to be firmly established, new problems have arisen; and an older representative of the evolution theory, Lamarck, has become the exponent of a solution which seems to be opposed to Darwin. Darwin's special contribution, Darwinism in the narrower sense, is an explanation of evolution through natural selection, and in contrast to it the Lamarckian views emphasise that the development of species is due to use or not-use of organs. Darwin himself was not opposed to the Lamarckian explanation, but in the struggle of parties his name has become the exponent of a school which emphasised the omnipotence of natural selection. The Lamarckians, however, insist on the impotence of natural selection, and claim that the origin of species is due to exercise or function.

Professor Plate's present volume, which is the second edition of a similar book that originally grew from a lecture given by the author some time ago in Hamburg, is a fair exposition of the situation, taking the ground that the present prevailing

¹ We are reluctant to venture into details, but as an instance we will mention only the case of Leibnitz who claims to be the "*auteur du principe*," viz., "*de la loi de la continuité*"; and yet the problem is as old as Parmenides and was discussed and considered by Aristotle, being known to these Greek thinkers as τὸ συνέχες or ἡ συνέχεια.

antagonism to Darwin will soon be overcome and that scientists will after all return to the master and recognise the wisdom of his explanations.

Darwin himself was not as narrow as the Darwinians, and we dare say that Lamarck would not have endorsed the narrowness of the Lamarckians. Both were broader than the schools that are now vigorously fighting each other. Although a confessed disciple of Darwin, our author does not exaggerate the significance of the principle of selection, and he thinks it would be wiser to speak neither of its omnipotence nor its impotence. He is glad to recognise the significance of the Lamarckian factors of evolution, and expects that the true solution can be found only by being fair to both views.

Professor Plate discusses in Chapter I.: (1) The Unessential Objections to Darwinism, mostly views based upon a misunderstanding of Darwin's propositions; (2) Essential Objections (pp. 32-84); this part is naturally more important, and deserves a closer examination than we can give it in the present review. Chapter II. discusses the Forms of the Struggle for Life, and of Selection. Chapter III. is devoted to the Auxiliary Theories of Natural Selection, Darwin's Own Theory of Sexual Selection, and other theories invented for the explanation of secondary sex characteristics; Roux's theory of the struggle of the parts within the organism; panmixia and the explanation of rudimentary organs; Weismann's hypothesis of germinal selection. In Chapter IV. the conditions are discussed which are presupposed for natural selection. The surplus of births, variability, and isolation. Chapter V. treats of the Extent and the Limits of the Darwinian and Lamarckian Factors. This chapter may be regarded as the most original contribution of our author. Having explained the idea of direct and indirect adaptation, he reviews the different methods of accounting for organic adaptation: first, the theological explanation; secondly, the vitalistic explanation; thirdly, the Lamarckian explanation; and finally the Darwinian explanation through natural selection. He criticises Wallace's proposition, that all specific characteristics are useful. Selection, however, is monotypical; it dominates throughout the world of living organisms, but not in the domain of inorganic nature.

The book contains a very useful list of the literature on the subject, and also a good index. —S.

ANSICHTEN UND GESPRÄCHE ÜBER DIE INDIVIDUELLE UND SPEZIFISCHE GESTALTUNG IN DER NATUR. Von *Franz Krasan*, Gymnasial-Professor i. r. und k. k. Schulrat in Graz. Leipzig: Verlag von Wilhelm Engelmann. 1903. Pages, 280.

The question has often been raised whether the evolution theory should be taught in school, and men of great authority, among them no lesser authority than the late Professor Virchow, have answered it in the negative. Here we have a schoolman in Austria, Franz Krasan, Professor in the Gymnasium at Graz, with the title of k. k. Schulrat, who presents a series of discussions on the origin of spe-

cies and kindred problems. The book is obviously the product of the author's practical work and proves beyond any doubt how these intricate topics can be ventilated in the classroom before scholars such as attend European gymnasiums. The treatment of the subject, which is mostly in the form of dialogues, may not appeal to the general reader but will certainly prove useful to teachers in colleges and collegiate institutes who cherish the ambition of broaching the problems of nature to their pupils and of awakening in them the spirit of scientific research. K. K.

DIE EVANGELIEN EINES ALTEN UNZIALCODEX. (BN-Text.) Nach einer Abschrift des dreizehnten Jahrhunderts. Herausgegeben von *Alfred Schmidtke*. Leipzig: J. C. Hinrichs'sche Buchhandlung. 1903. Pages, xl, 116. Price, 4 Marks.

The author publishes the Greek text of Mark, Luke, and John after an ancient uncial manuscript in the National Library at Paris. The codex is of the thirteenth century, and has been copied, according to a note, at the request of the Abbess Olympias, whose name henceforth it will bear. This codex Olympias served as a reading book in the church of the martyr Theodorus, and contains, in addition to the text, several personal entries. The probable site of the monastery is Egypt, perhaps Syria. A Frenchman acquired the codex, and it was finally incorporated into the National Library.

A close inspection shows that the manuscript is a careful copy of an older codex, and may therefore become of importance for settling some of the mooted points in variants. Its archetype seems to have been undertaken with the purpose of giving a synopsis of the four Gospels. We have the diatessaron of Ammonius, and Hesychius tried to do the same without letting the contradictions among the different Gospels disappear. Tatian's *Harmony of the Gospels* followed in the same line, and is apparently accomplished in opposition to Ammonius, for Tatian himself especially blames the latter for removing the contradictions, which he regards as intentionally introduced by God.

The present text edition is carefully done, and Schmidtke's work will prove a valuable help to text-critics.

—a—

A HISTORY OF EGYPT FROM THE END OF THE NEOLITHIC PERIOD TO THE DEATH OF CLEOPATRA VII. B. C. 30.¹ By *E. A. Wallis Budge*, M. A., Litt. D., D. Lit., Keeper of the Egyptian and Assyrian Antiquities in the British Museum. Illustrated. 1902. Price, 8 Vols., \$10.00.

Egyptology is making quick progress. The spade unearths new facts almost daily, and since the excavations have been carried on more systematically much

¹ The American publishers are The Oxford University Press, but The Open Court Publishing Company has made arrangements with them to act as agents; accordingly, copies of the work may be obtained by applying directly to us.

light has been shed upon the history of the valley of the Nile, especially the very dawn of its civilisation. Professor Budge, one of the foremost Egyptologists, who has the best means of keeping abreast of the times and incorporating the results of his colleagues' work into his own investigations, here presents us the matured product of the present state of knowledge. The undertaking is gigantic, but he absolves the task to his credit. The contents of the several volumes are as follows: Vol. I., Egypt in the Neolithic and Archæic Period; Vol. II., Egypt Under the Great Pyramid Builders; Vol. III., Egypt Under the Amenemhats and Hyksos; Vol. IV., Egypt and Her Asiatic Empire; Vol. V., Egypt Under Rameses the Great; Vol. VI., Egypt Under the Priest-Kings and Tanites and Nubians; Vol. VII., Egypt Under the Saïtes, Persians, and Ptolemies; Vol. VIII., Egypt Under the Ptolemies and Cleopatra VII.

—5.

ENCYCLOPÆDIA BIBLICA. A Critical Dictionary of the Literary, Political, and Religious History, the Archæology, Geography, and Natural History of the Bible. Edited by The Rev. *T. K. Cheyne*, D.Litt., D.D., Oriel Professor of the Interpretation of Holy Scripture at Oxford and formerly Fellow of Balliol College, Canon of Rochester, and *J. Sutherland Black*, M.A. LL.D., formerly Assistant Editor of the *Encyclopædia Britannica*. Volume IV., Q to Z. New York: The Macmillan Company. London: Adam and Charles Black. 1903. Price, \$5.00 net.

The fourth volume of the *Encyclopædia Biblica* now lies before us, containing the letters Q to Z, thus completing the work. We have to repeat that the enterprise is a gigantic one, covering the vast space of the entire Old Testament, to which have been added in this last volume such articles as refer to the development of the New Testament from the Old. For say the editors: "The yearly advancing study of the apocryphal and apocalyptic Jewish literature is destined to have considerable effect within the near future on the treatment of the religious ideas of both parts of our Bible." Accordingly, a few descriptive articles relating to these new subjects can only be favorable to the study of Old Testament theology, and will probably in the not distant future be considered indispensable.

The present volume comes fully up to all the expectations that can be had. It is a stately volume of over 1000 pages, and contains essays of which many might appear in book form and certainly contain more material than can otherwise be found in many volumes. The tone of the expositions may sometimes be considered too conservative by scholars, but this is more excusable of a biblical encyclopædia, which is designed not only for the use of scholars but also for clergymen, and accordingly the pastoral side should not entirely be lost sight of.

We may mention especially the care with which the articles on the following topics have been written: Resurrection, Sacrifice, Saul, Sennacherib, the Sermon on the Mount, the Sethites, Shekel, Simon Magus, Simon Peter, Sinai and Horeb, Sodom and Gomorrah, Solomon, Son of God and Son of Man, Spiritual Gifts

Syria, Tabernacle, Temple and Temple Service, Texts and Versions of the Old Testament, Tobit, Trade and Commerce, the Tribes, Wine and Strong Drink, Wisdom Literature and the Book of Wisdom, Zoroastrianism, etc., etc. —c.

ALBUM-KERN. Opstellen geschreven ter eere van *Dr. H. Kern*. Hem aangeboden door vrienden en leerlingen op zijn zeventigsten verjaardag. Leiden : E. J. Brill. 1903. Pages, xvii, 395.

There is a regulation in Holland according to which all professors retire with full pay at their seventieth year. Professor Kern having attained the age of a septuagenarian now enters upon his well-merited release from work, and in his honor his friends have made this remarkable collection.

It is a unique book, this *Album-Kern*, a volume in large quarto containing collections of several most prominent professors of Sanscrit, Pāli, Chinese, Anglo-Saxon, Dutch literature, etc. It is introduced by a letter to Professor Kern, written by none less than Prof. Otto von Böhtlingk. The most remarkable contribution is the translation of a Sanskrit poem, the gambler's song, one of the seventy songs of the Rigveda, published by Geldner and Kaegi. The manuscript of the translation, which is here reproduced in facsimile, was found among the late Professor Roth's papers and it is probable that it is his own version and versification. Certain it is that it is written from the beginning to the end in the handwriting of the late Professor Roth.

We hope that those contributions of the *Album-Kern* which treat subjects of universal interest will in time be republished in some more accessible form.

The frontispiece is a faithful portrait of Professor Kern.

P. C.

THE SURD OF METAPHYSICS. An Inquiry Into the Question : Are There Things-in-Themselves? By *Dr. Paul Carus*. Chicago: The Open Court Publishing Co. London: Kegan Paul, Trench, Trübner & Co., Ltd. 1903. Pages, vi, 233. Price, \$1.25.

This book contains a precise outline of the philosophy of the editor of *The Monist*, tested at one of the most critical questions of metaphysics, the doctrine of things-in-themselves. Surd in mathematics is that which is incapable of being expressed in rational numbers, in a word the irrational, and applying the same conception to philosophy, our author investigates the claim made by metaphysicians that there is some irreducible quantity in experience which leads to metaphysicism, agnosticism, or mysticism, finding a classical expression in the doctrine of things-in-themselves. Dr. Carus rejects the assumption of things-in-themselves, quoting one of the Goethe-Schiller Xenions as his motto :

"Since Metaphysics of late
without heirs to her fathers was gathered,
Here at the auctioneer's
'things-in-themselves' will be sold."

—Xenions of Schiller and Goethe.

While the philosophy of Dr. Carus is anti-metaphysical, anti-agnostic, and anti-mystical, he warns the reader not to overlook the truth that is contained in the theory of things-in-themselves. He discusses in the first part his own proposition—viz., an elimination of the metaphysical surd from philosophy. He comes to the conclusion that the metaphysical x is not unknown but admits of a solution, leading to the new philosophy, not of nescience but of science (pp. 1-64). In the second part Dr. Carus discusses the views of modern thinkers, commonly known to be progressive but still retaining the residue of a belief in a metaphysical surd (pp. 65-144); and finally in the third part he shows the significance of his solution by applying it to the problem of the soul (pp. 145-226).

Much of the contents of this latest production from the editor's pen has appeared in *The Monist* in the form of essays, but they are here collected and reduced to system so as to exhibit their interconnection and show the scope and method of the author's views. Σ.

FUNDAMENTAL PROBLEMS. The Method of Philosophy as a Systematic Arrangement of Knowledge. By *Dr. Paul Carus*. Third Edition. Chicago: The Open Court Publishing Co. London: Kegan Paul, Trench, Trübner & Co., Ltd. 1903. Pages, xii, 373. Price, \$1.50.

This book was out of print for some time, the author being too much engaged in other literary work to revise it for a new edition. In the meantime the publishers were pressed again and again with orders and are now glad to announce its reappearance. The general scope of the third edition is the same as that of the second edition, and our author remains faithful to the original motto of his work, tersely expressed in these sentences:

"Not agnosticism but positive science,
Not mysticism but clear thought,
Neither supernaturalism nor materialism,
But a unitary conception of the world,
Not dogma but religion,
Not creed but faith."

Σ.

DIE WELTRÄTHSEL. Von *Ernst Haeckel*, Professor an der Universität Jena. Bonn: Verlag von Emil Strauss. 1903. Pages, 168. Price, 1 M.

Professor Haeckel's *World Riddle*, which was reviewed at length some time ago in our columns, has appeared in a popular edition, in both German and English dress.¹ The enormous success of this book proves not only the versatility of its author, but also the deep interest which the public of the present day take in the popular explanation of religious topics from the standpoint of a scientist.

—p—

¹ English publishers, Charles Watts & Co., London.

MR. THOMAS J. McCORMACK.

Mr. Thomas J. McCormack, our assistant editor, has been elected Principal of the La Salle and Peru Township High School, and will enter upon his new duties with the beginning of September next.

Mr. McCormack came to us soon after the completion of his studies. He was educated in Princeton, N. J., where he was graduated in 1884, and took post-graduate courses in Leipzig and Tübingen, Germany, one term at each of these universities (1884-1885). He became connected with The Open Court Publishing Co. in 1888, where his most important work consisted in making translations from the German and French. He rendered into English some most notable essays of the foremost mathematicians, physicists, biologists, physiologists, psychologists, and theologians of Europe, such as Lagrange, Grassmann, Poincaré, Klein, Schubert, Boltzmann, Hering, Wundt, Ribot, Binet, Delbœuf, Topinard, Haeckel, Weissmann, Eimer, Carus, Sterne, Lasswitz, Cornill, and Delitzsch.

Since 1897 Mr. McCormack has been more closely affiliated with The Open Court Publishing Co. in the capacity of assistant editor.

Mr. McCormack's scientific program is contained in a lecture which he delivered before the Science Club of the Faculty of Northwestern University, Evanston, Ill., and which was published in *The Monist*, Vol. X., No. 4, under the title "On the Nature of Scientific Law and Scientific Explanation."

Mr. McCormack has also edited works by De Morgan, Leibnitz, Hume, Berkeley, and Descartes, and he has written a number of biographies of mathematicians and philosophers which were published with portraits in *The Open Court*. To this last journal and to *The Monist* he likewise contributed a large number of critical notices of current scientific literature and articles on miscellaneous scientific topics.

All the translations of Mr. McCormack are excellent, but his main work is Mach's *Science of Mechanics*, which is especially noteworthy on account of the difficulties of the subject-matter.

In parting we express to Mr. McCormack our thanks for the high grade of work which he accomplished during all these years. Our best wishes accompany him in his new career, and we cherish the confidence that his labors will be attended with success, for he has, in his studies, always kept in mind the theory of education, devoting special attention to the maturest methods of teaching according to the principles of modern science.

P. C.

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A QUARTERLY MAGAZINE

Devoted to the Philosophy of Science

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